# approach

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vol. 6 #8



The other way to stop...

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VOLUME 6
NUMBER 8



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**Pages 36 and 37—USAF Maintenance Review Pages 38 and 39—Courtesy Curtiss Wright Corp.**

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# LETTERS

### Life Vest Inflation Tube

Sir:

Reference APPROACH, Nov. 1960, p. 24, "Life Vests." Is not the statement "In the water, the (oral inflation) valve is normally kept in the same locked (screwed out) position" in direct conflict with Clothing and Survival Bulletin 22-58A, para 5b, sub para f.?

ANYMOUSE

**● The APPROACH statement is correct. BACSEB 35-58 of 16 Dec 1958, *Inflatable Life Preservers and Inflatable Life Rafts; deflation of,* superseded parts of BACSEB 22-58A. BACSEB 35-58 states "All personnel using or handling inflatable equipment are to be informed of the importance of thorough deflation and of the importance of maintaining deflation by keeping all valves closed at all times (particularly the oral inflation tube valve) . . . Deflate oral compartments; use suction pump to completely collapse compartments; screw lock oral inflation tube."**

### Angle of Attack

Sir:

I am a member of a West-Coast Squadron soon to experience day & night carquals. We fly an aircraft (A4Ds) that's been around a while, long enough, one would think, to be retrofitted with almost any piece of gear around—particularly any piece of gear so common that it is now utilized even on Basic Training Command aircraft. A piece of equipment that Safety Officers say is terrific. "Anymice" by the dozens belatedly praise it. LSOs think it was made for them.

Some recent graduates of NATC have never flown an aircraft without it. Most aircraft groups fly aircraft with this gear installed and these are only "proficiency" aircraft by any standards. APPROACH publishes articles about the theory of the gear—trying to sell oldtimers on the fact that it really works. Even the Air Force likes it! I just completed a "jet refresher" course and used it to good advantage, then joined an active A4D squadron preparing for overseas deployment and find that even tho I'm flying a "high-performance aircraft"—No Joy! NO ANGLE OF ATTACK INDICATOR!

I submit this on an Anymouse Form only because I consider the AAI a safety-of-flight item—RIGHT?

Any comments Headmouse?

A4D MOUSE

**● The program was delayed by efforts to find a system compatible with the A4D airframe. NavAirLant got the first installations because they had more A4Ds. Installations are now beginning in AirPac.**

**APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.**

### Color Bind

Sir:

Reference is made to fluid lines color code chart B26-G1-860, prepared and distributed by the Naval Aviation Safety Center.

A comparison with Design Specification AND-10375 reveals: (1) the fluid lines color code *orange* is reflected as *red* where applicable, (2) the color sequence of *blue/yellow* for hydraulic lines is shown as *yellow/blue*, and, (3) the geometrical symbols for fuel, rocket fuel, lubrication and warning symbols are not accurately transcribed.

In view of the ready reference value of the subject chart, attention is invited to the deviations from Design Specification AND-10375.

W. D. BONVILLIAN, CAPT.
Commanding Officer

NAS New York

Sir:

Fluid line color codes in poster no. B26-G1-860 for compressed gas, instrument air, pneumatic and electrical conduit appear to be in conflict with Design Specification AND-10375. *Red* is shown on the poster instead of *orange*.

One other discrepancy of lesser importance, is that the colors for hydraulic are in reverse order—*yellow/blue* vice *blue/yellow*.

If confirmed, request that six copies of the correct poster be forwarded to this command.

J. F. DOHERTY
CO, VU-3

NAAS Brown Field
Chula Vista, Calif.

**● Color blindness, color printing processes and automatic distribution combined against us leading to color discrepancies in the subject poster. Accordingly, a corrected poster is currently being processed and will be distributed with NASC publication CROSSFEED during January 1961.**

### Mutual Aid Possibilities

Sir:

Much has been written about the always alert crash and rescue crews and rightly so for they are an integral part of any naval air station. However, of equal importance are the many metropolitan

One of the Mutual Aid Companies demonstrates the use of its standard equipment to put out a gasoline fire enveloping the simulator.

fire companies and volunteer fire companies which belong to the civilian communities which surround most of our air stations. In naval aviation the need for immediate crash fire and rescue assistance in event of an aircraft crash has long been recognized. This year Naval Air Station, Anacostia hosted its Fifth Annual Crash Fire and Rescue Program.

All of the more than 125 fire companies within a 15-mile radius of the air station have been organized into mutual aid companies. Each year they return to NAS Anacostia where they not only observe the latest military apparatus in action but actually demonstrate the use of their own apparatus to extinguish simulated crash fires. One of the primary purposes of this program is to acquaint the visiting non-military crews with the problems of crash rescue and fire fighting. By participating in simulated crash procedures these groups will be better prepared to handle aircraft accidents which might occur in their own community. Speed is essential. Fortunately an actual demonstration of their training has never been necessary. However, the probability is inherent in naval aviation, and safety makes this Mutual Aid Fire Department theme mandatory. The local fire company familiar with their own area and having been trained by NAS Anacostia in crash fire and rescue could mean the difference between saving a life and death.

H. E. HOHN, LCDR, USN
Service Information Officer

**● This and a similar program reported by NAAS, New Iberia, La., are excellent examples of what safety-minded air stations can do not only to further the overall aviation safety program of the Navy, but to strengthen the Navy/community relationship. Air stations interested in obtaining more complete details of the above program may get it by writing the Service Information Officer, NAS, Anacostia, Washington, D. C., or NAAS, New Iberia.**

## *Tepee Methods*

Sir:

On page 32 of your November 1960 issue, you have pictured a para-tepee . . . try my method of putting up a para-tepee:

Use one pole about 11 feet tall. Tie cords around the top of both the chute and the pole, and use good long stakes to tie the bottom down to the ground. Using a 26-foot chute and cutting out between panel number(s) 13 and 26, this will give you 14 feet across from any side.

As the cords run from one stake across the top of the pole and down to the far stake, it will stand up in any weather. There is no hole at the top and no side poles to cut or bang your head.

RAY BUNTING

Crash Survival Gear Sales
Milford, Del.

**● A number of methods of para-tepee construction are taught by the Navy, and basically, your method is the same as one of these. However, the people at the Navy Survival Training Unit, Brunswick, Me., which sponsored the article in APPROACH to which you refer, feel that the multi-pole para-tepee is preferable. They are of the opinion that with this location of the smoke vent you get a better draft on your fire which is usually built in the center of the para-tepee. They also find that it is easier for most of our pilots to learn to construct the para-tepee using this method.**

## *Fuel for the UO-1*

Sir:

I refer to the article, "A Change of Pace" in the October edition of APPROACH.

On page 44, in the discussion concerning the power plant of the *Aztec*, UO-1 aircraft, the minimum fuel grade was listed as 91/96, with 100/130 as an acceptable alternate grade fuel; 115/145 was listed as a restricted fuel for one time use only.

Bureau of Aeronautics Instruction 10341.1, "Aircraft Engine Fuels, Utilization of," dated 24 November 1959, does not list the UO-1 aircraft; however, the forthcoming revision will include this aircraft and list the approved fuels as 91/96, 100/130 and 115/145 without any use restrictions. This is based on Lycoming's Service Letter No. L-103A of 19 December 1958, "Aviation Fuels for Lycoming Engines."

C. C. SINGLETERRY

Technical Ass't.,
Fuels & Lubricants
Power Plant Division,
BuWeps

**● Thank you for fuel info. Lacking engine manufacturer's data we had only the airframe (Piper) manufacturer's info to go by.**

## *Binding Situation*

Sir:

In reference to your request for, "Identification," (September 1960 issue), Page 34, titled "A4D Murphy Alert," credit must go to Ed Morrison, NAESU REP., AND myself. I was very pleased to see the article appear, and I hope it brings results.

Your magazine is eagerly awaited each month here in our electric shop. Please keep up the good work.

A. E. LENTZ, AE1

P.S. Your offer of 6 months supply of imported cheese is also eagerly awaited!!!

**● Headmouse's offer and your acceptance makes for a binding contract. Accordingly, Edam, Swiss, Welsh Caerphilly, Canadian Cheddar and Sharps are on the way—courtesy of Elias Codd's, Norfolk. In addition to being an epicure of fine cheeses, Mr. Codd is among the nation's top Savings Bond salesmen, having sold over 4 million dollars worth.**

## *Solve 'Beep' Mystery*

Sir:

At approximately 0800 on 21 November 1960 at the NAS Parachute Loft a pilot's emergency beacon was inadvertently placed in an operating status for a period of one hour while being installed in a PK-2 pararaft kit.

The pilot's emergency locator beacon, which is being installed in accordance with BACSEB 37-60*, has been provided to assist search and rescue facilities in locating pilots after emergency bailouts. The beacon transmits a modulated "beeping" sound on the UHF guard channel frequency of 243.0 MCS at about one second intervals, with the audio frequency varying between 800 to 3000 cycles per second. The beacon is actuated immediately upon parachute deployment and continues to transmit through a flexible antenna. After touchdown from bailout, the flexible antenna may be removed from the beacon and replaced by a telescopic whip antenna for optimum range.

Investigation of the incident revealed that pilots, tower operators, and search and rescue personnel are unfamiliar with the beacon signal as indicated by the following:

Pilots flying in the area, who heard the signal on guard channel, became annoyed with the tone and turned their UHF tranceivers from T/RG to the T/R position.

The tower broadcasted a request for the person transmitting on guard channel to identify himself.

Although the beacon transmitted on the UHF guard channel and completely saturated the immediate area with a distinctive tone modulation for approximately one hour, no attempt was made to locate the source of emission or to activate search and rescue facilities.

At least 8 pilots heard the transmission over the base radio before one recognized it as the emergency signal.

As a result of this incident, it is recommended that, in the interest of increased aviation safety, all pilots, tower operators and search and rescue personnel be indoctrinated in the subject beacon with special emphasis directed toward recognition and identification of the emergency signal.

O-I-C VF DET.

**(*BACSEBS 12-60 and 40-60 also apply to installing the AN/PRT-3.—Ed.)**

## *Training Plane Guards*

Sir:

. . . vital needs of aviation and rescue team cooperation were dramatized recently when 35 men from USS HENDERSON (DD-785) and USS GURKE (DD-783) assembled in Attack Squadron 52's readyroom. Emergency ditching of aircraft in water has repeatedly pointed out the urgency for rescue team understanding of pilot needs and equipment operation in relationship to a crash at sea.

The team problem was mutually recognized by commanding officers of both destroyers through their frequent assignment as plane guards during carrier operations. The problem was quickly solved as CDR A. R. English, skipper of VA-52, fulfilled such educational needs by ordering a series of lectures explaining emergency equipment in the aircraft as well as equipment worn by the pilot.

These lectures were immediately followed by live demonstrations from the cockpit of the AD-6 *Skyraider*. Demonstrations were simulated to such a point that each team had an opportunity to remove an outfitted pilot from his aircraft in a minimum amount of time.

"The cooperation of plane guard destroyers and operating squadrons," commented CDR English, "is an extremely practical approach toward better safety procedures."

We'd have to agree with the skipper's belief for VA-52 has just completed more than 8000 hours of accident-free flying in addition to winning the coveted CNO annual safety award.

DON H. WALKER, AN

NAS Miramar

**● Outstanding! Considering the number of destroyer assists and rescues, it is pure life insurance for the air groups to establish liaison with the destroyer crews and acquaint them with the problems.**

Plane guard destroyer men check out rescue teams in removing a fully outfitted pilot from cockpit of an AD.

# The other way to stop...

Those of you who have heard the Bob Newhart record of "The Driving Instructor" will know there are two ways to stop a car. The other way is to throw it into reverse.

Similarly, there are two ways to stop an airplane aboard ship. The other way is the barricade.

. . . gone! The friendly voice of your LSO may eliminate that all-alone feeling . . .

Pilot's-eye view of the barricade. Note two mirrors. Meatball is going . . . going . . .

## by LCDR R.W. KENNEDY

. . . finally. There it is again—no sweat!

—Sure is dark tonight.

—Yeah. One of them nights that separates the men from the boys.

—How *you doing*, boy?

The 07 level was crowded with well-wishers for the scheduled night carquals. The 1930 launch of four F4Ds had been kicked off and were setting up for their first pass.

Number one was waved off early. The flight deck crew was still picking up the bits and pieces after the launch. Dark shapes could be seen scurrying around the landing area, double-checking arresting gear and mirror.

—Sure envy those guys. Where else can you work in a pine-panelled catwalk and still enjoy a 35 knot breeze?

Don't forget the income tax they don't have to pay and the ideal working hours, too. In port they sometimes get eight hours sleep.

Finally the apparent confusion below the spectators eased off and the arresting gear officer waved a green wand at PriFly.

—Here we go.

The second *Ford* was waved off. He added power and roared by.

—What was the matter with him? Looked okay to me.

—He was over his gear down limit speed. Probably clutched on his first night pass.

The next three passes were routine. The second boltered.

—Looked like he landed a little long. Didn't see much in the way of sparks from the hook.

—Long? After that one they better check the elevator.

Number 2's third approach ended in another bolter.

—Lots of sparks that time. I thought sure he got a wire.

—Number 5 on a 4-wire boat maybe. He's so

Crusader's plight is obvious.

shook now he's probably in AB downwind.

The spectators all jumped as the bull-horn just over their heads blasted out:

CHECK HIS HOOK NEXT PASS.

—Guess maybe all those sparks came from a broken hook.

—Doubt it. The old man's just being extra cautious. Soon as that character gets a wire he'll settle down. Unless he tries too hard and drapes himself over the ramp.

The next pass the F4D did try too hard. The hook hit the deck well aft of number 1 wire. Sparks followed him down the deck but once again he boltered. And that pass took him below bingo fuel.

The bull-horn jarred the spectators:

STAND BY TO RIG THE BARRICADE AFTER WE TRAP THE OTHERS.

—Never saw a barricade rigged. How long does it take?

—Five or ten minutes, I guess.

—What do they look like?

* * * * *

Let's interrupt a minute here. Maybe you've asked yourself these same questions. There was a time of iron men and axial decks when every pilot knew precisely what the plans were if he didn't latch onto a wire. He saw those plans every landing. Pilots were divided into those who had had a fence and those who would.

Nowadays busted fences have been pretty much relegated to TV westerns. There are plenty of pilots who have never seen what they look like from 500 yards astern. Times change.

Of course the reason is well known. Angled decks did away with most fences just as they dropped the accident rate. Not so well known,

After centerline touchdown (above), nose collapses but barricade is engaged.

though, are pilot techniques. *Or even the difference between a barrier and a barricade.* Accident reports which discuss F8U barrier engagements are not technically correct. That was a barricade that stopped the U-bird.

Ever wondered why they call it a barricade now? Let's go back a few years and see how the name got changed.

The first arrested landings (you've seen the pictures) had several tailhooks engaging cables across the deck. The plane picked up these cables and dragged sand-bags tied to the cables. This got to be too much work and the plane quit trying. We aren't very far removed from that stage now, just more refined. Which shows that we were very smart at the beginning or else we've been slow ever since. Take your pick.

Now even with real reliable type sandbags the Air Boss of the PENNSYLVANIA, just before the first landing, was concerned. Suppose some clown came in hot at 50 knots and missed all the wires. Where would that leave the PENNSY'S smokestacks? The Air Boss talked it over with his Flight Deck Officer and First Lieutenant. The latter didn't know much about airplanes but he was an old hand with awnings. So they rigged a big one forward of the landing platform and the stacks were safe. Eugene Ely, whose name was number 1 on the flight schedule, didn't go for this too hot. After all, he sat out in front. He decided not to take any chances. He came aboard with ten inches hook-to-ramp and didn't even come close to the barricade.

When our first carrier, the LANGLEY, went to sea in 1922 she was equipped with the first barrier, not barricade. This arrangement was enough to make strong men weak. It was nothing more than a cable stretched across the deck high enough to engage wings, wheels, props, or anything else out front. The barrier cables were firmly secured to the deck on either side; the only "give" was the stretch in the cable.

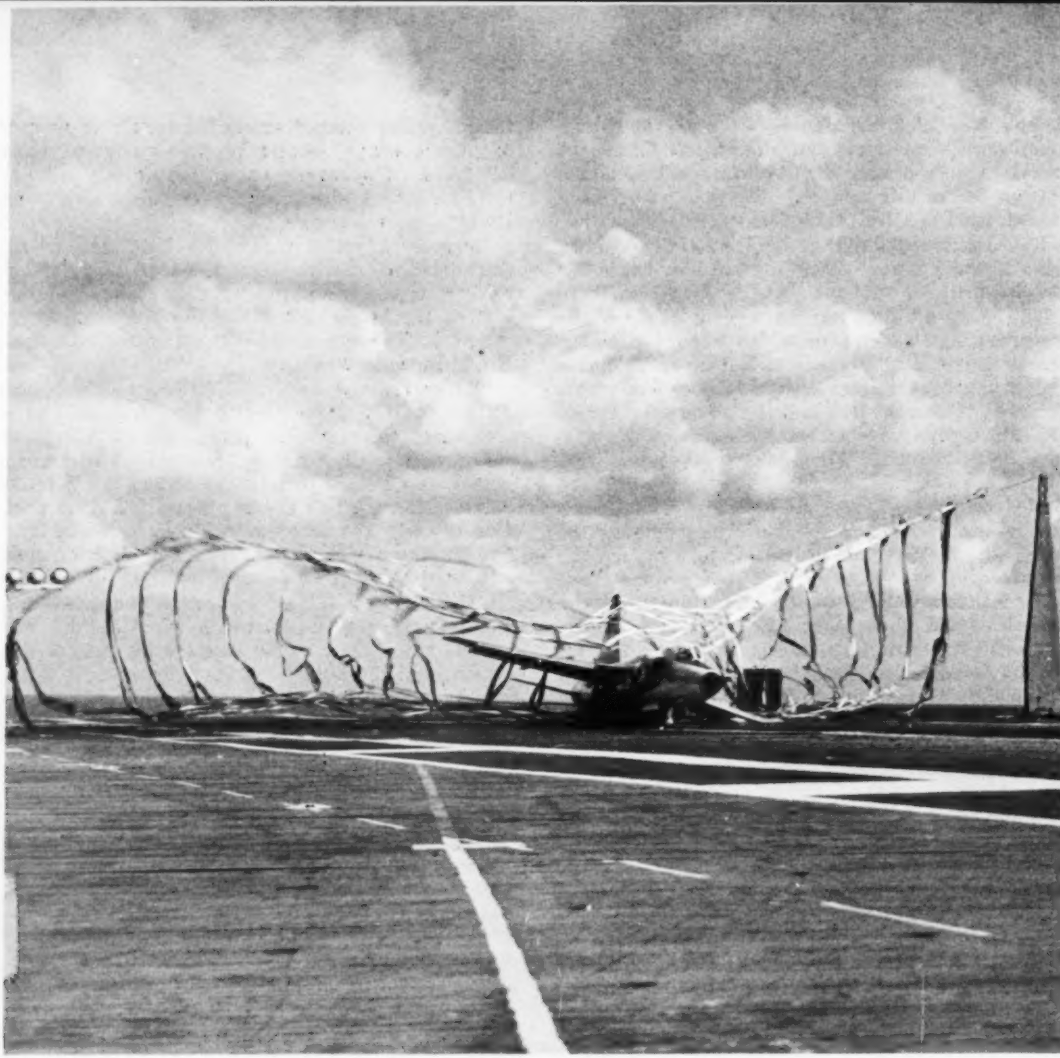
Eventually, out of regard for the pilots' necks, the barrier cables were connected to a regular arresting engine. This allowed the cable to pay out just as the cross-deck wire did when engaged by the hook. The number of stiff necks treated by the Flight Surgeon went down.

This barrier arrangement served well until the F7F made the scene. With two engines and a nosewheel the *Tigercat* posed new problems to the designers of arresting gear. Like, the nosewheel wasn't built to take the strain of a barrier cable. And the two engines were in a good position to sever the cable and fling it in the cockpit. Finally there was no longer a big hunk of steel out front to run interference for the pilot.

A quick walk-around inspection indicated that the best place to latch onto a misplaced F7 was by the main gear. This was strong enough and was behind the pilot. Somehow or other it would be necessary to have the barrier cable on the deck so the nosewheel could pass over. Then the wire had to be raised to catch the main gear. Divide wheelbase by speed and you can see that this minor miracle also had to be performed in a short time.

The first attempt to solve this problem included an extra wire, smaller than the barrier cable, raised across the deck. The small wire was attached to the barrier cable by vertical wires. The nosewheel was invited to engage the small wire and pass over the main barrier cable at the same time. Then, by dragging out the small wire, the

Bird comes to stop in tangled array of straps and cable.



With one main gear damaged, F11F pilot took barricade. Picture at instant of engagement shows typical ripple action of nylon straps.

main cable would be hauled up in front of the main landing gear.

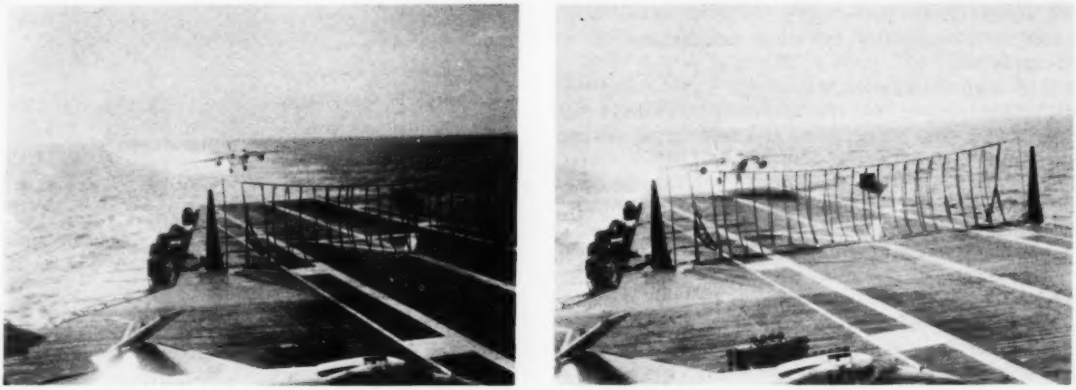
It worked as advertised, but one thing made it hard to sell: the small wire frequently wound up in the cockpit. The F7F had a single-place version. No room for uninvited guests. Back to the drawing board.

The engineers thought the principle was good so they looked around for other ways to use the basic idea. A suspended cable made out of nylon parachute webbing was tried in place of the small wire. It worked, and the Davis barrier was born.

Technically the Davis barrier is referred to as a barrier adapter since it adapts a cable barrier for use with nosewheel airplanes, but that needn't slow you down. Neither should the fact that they changed the top strap to cotton. Read on.

For the record, service change No. 11, dated 6 February 1948, provided the Davis barrier for use with Mk-4 and -5 arresting gear. The service change said "for nosewheel aircraft having jet propulsion or twin engines." This gives some clue to the eventual fame of the Davis barrier: although the original problem was the F7F the solution handled jets, too.

When properly engaged, the Davis barrier stopped airplanes reliably and with very minor damage. During Korea ADs and F4Us which hit the cable barrier suffered in the prop, cowling and occasionally had sudden stoppage of the 3350



Big A3D boresights barricade. One main gear is unsafe and collapses.

or 2800. *Panthers* and *Banjos*, on the other hand, managed to taxi away from the Davis barrier.

In fact, it was so successful that the Air Force got jealous. During the Korean War they tried it ashore. They renamed it the MA-1A barrier, but this didn't affect its performance. It worked fine. It still does, tied to chain gear at Air Force bases. And a few are used at Naval Air Stations with a lot of TV traffic.

There were and are some shortcomings to the Davis barrier. Any garbage on the racks can deflect the barrier cable away from the main gear. Speed brakes on some birds can do the same thing. And what, pray tell, happens to the clown with no nosewheel?

On board the carriers a rash of disastrous accidents occurred when jets went through or over the barriers. While the flight deck crew cleaned up the mess forward, a high priority search was underway for some means to insure a positive stop. Even chain link fence was considered, but, fortunately, rejected. The final choice was an all-nylon net.

This new device was taller than the biggest plane it had to stop (which naturally means it has grown considerably since then). Across the top and bottom and on both ends were load-carrying straps. Connecting the top and bottom together were nylon risers. The net was connected to an arresting engine. To differentiate between the net and the barrier, the net was christened "barricade." The Air Boss on the PENNSYLVANIA wouldn't have been impressed.

Several emergency arrests occurred aboard ship in which the barricade, installed forward of the barriers, assisted the barriers. Then, on 28 June 1952 the first barricade-only arrest: an F9F-2 dove for the deck, bounced, and cleared all the barriers. Then and there the barricade paid


Safe! Wing tip rests on deck.

for itself many times over. The *Panther* was snatched out of the sky like a butterfly in a butterfly net.

Although the barricade is all nylon it can impose heavy local loads on the airframe. Damage to slats, flaps, gear doors, wing and fin leading edges, and intakes frequently occurs. Tin-benders object, but pictures of a schnortenzoomer tearing into the pack before the arrival of the barricade convince everyone else the damage is small price to pay for the insurance.

The barricades received considerable wear from taxi-overs, so they were supposed to be discarded after a month, unless they were engaged first. The nylon industry was looking up. However, they went back to wash-and-wear items later when the ANTIETAM completed a yard period and left with an angled deck. For normal operations the bolter replaced the barrier and the barricade. To the immense satisfaction of the Arresting Gear crew the nylon and wire rope contraptions were struck below.

But wait. Leave us not forget the clown in the F4D with the broken hook. What happens if bingo fuel is a tad more than his gages speak? Best we keep the barricade handy, just in case. And since we'll need it in a hurry for emergencies we'd better have a rigging drill now and again to stay in shape. The AG crew went back to work.

At this stage of the game we needed barriers for the ADs, barriers with adapters (okay, the Davis barrier) for the S2F family. The barricade handled the rest. Since the barriers meant extra weight and storage space, and since the barrier adapter had limitations, the possibility of using the barricade for props was investigated. It worked, so now angled deck ships need only the barricade. The one exception is the ANTIETAM. Though she led the way she still has to keep barriers aboard since she isn't fitted with the stanchions needed to handle the latest barricades. The VALLEY FORGE and the LAKE CHAMPLAIN are also excepted, naturally as they are the last axial decks operating, and must do without the luxury of bolters.

Which finally brings us up to date, with barricades only, and with even them out of sight.

What do they look like? This gets us back to the original question up in vulture's roost. As the picture shows, they look like a Monday morning clothesline. Hanging from the top load-carrying strap you can see the verticals which latch onto the airframe. The bottom load-carrying strap is out of sight for a very good reason. It is hidden behind a small ramp or in a slot in the deck. This protects the bottom strap if you engage the barricade on the morning you left your nosewheel at home.

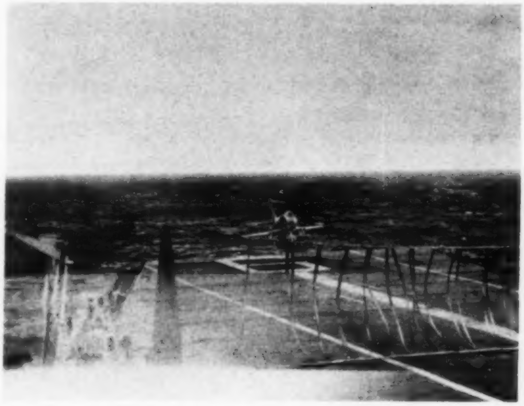
**This article was prepared by LCDR Robert W. Kennedy of the Bureau of Naval Weapons with the help of engineers from BuWeps and the Naval Air Engineering Facility (SI), Philadelphia. LCDR Kennedy sandwiched PG school between VS and VAH tours prior to reporting to BuWeps.**

On either side are the stanchions which hold the barricade up. After the net is engaged the stanchions have nothing further to contribute so the net is detached by means of shear pins, and is then free to drape itself all over.

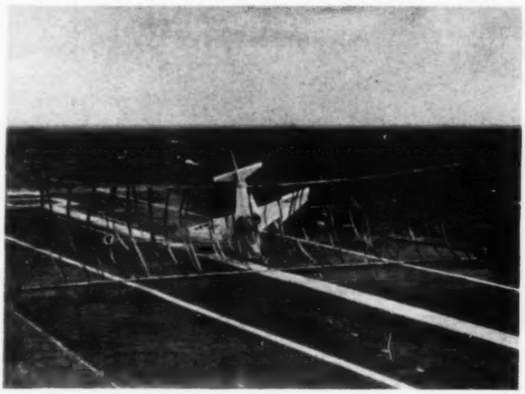
The barricade is stowed where it can be yanked out in a hurry. The FORRESTAL and later have a storage compartment right under the flight deck. By opening the hatch, the barricade is started out; muscle and tractors do the rest. Prior to CVA-59 the barricades are stowed in the gallery deck adjacent to the catwalk. Deck-edge rollers are provided so the net can be dragged up on deck quickly. That's the one that spilled you into the catwalk last week.

Once laid out on deck the barricade must be connected to the stanchions which normally lie flush in the deck. The net also is connected to a

**With today's increased tempo of carrier operations it is all the more important that every means of preventing carrier aircraft accidents be vigorously pursued. To this end NASC has published a *Carrier Summary*, covering all phases of carrier operational problems for more than a two-year period. Significant accidents and incidents are reviewed, including those involving LSO, Air Department Personnel, Equipment Malfunction (including arresting gear, catapult and mirror out), Weather, Supervisory Personnel, and Ground Accidents. While distribution was made late last fall to appropriate units, a limited number of additional copies are available from NASC for pilot and carrier crew training on request. Several safety officers have reported good results with group discussions of pertinent chapters in the Summary.**



One-legged A4D looking for a home. Note lineup.



Starboard wheel stub engages number 1 wire. Hook is down but out of position to engage wire.

The result. Where would he have been without the barricade?

purchase cable belonging to a standard Mk 5 or Mk 7 arresting engine. Finally air pressure is applied to a cylinder to raise the stanchions and lift the entire assembly into position. Or at least it's supposed to. Lately there has been some question as to the lifting ability of the cylinders. Originally operating at 300 psi, they have been upped to 405. However even this boost has proved unequal to the task of raising the weight of the barricade against wind over deck. Hinging the stanchions so they erect aft helps some. The INDEPENDENCE and BENNINGTON have this feature now and the WRANGER MARU will shortly be changed. Still, even this doesn't seem to solve the problem completely. The INDEPENDENCE has reported that an extra boost is needed to start the stanchions up.

Probably the safest way of supplying this extra push is the RANGER's method: tie a nylon strap from the top of the stanchion to a tractor and haul away. One note of caution: if you've ever tried starting a recip with a bungee you'll remember that the driver objected to being in the line of fire. The tractor driver towing the stanchion up is in the same position. If the nylon parts, something besides his ribs should be provided to stop the nylon strap.

How long does it take to rig a barricade? A lot of statistics are available from the monthly flight deck reports furnished by each ship. However, a quick check of these reports shows that, as the feller said after the honeymoon, it all depends on how you count. The maximum time reported recently is 5 minutes and 2 seconds; the minimum is 1 minute and 10 seconds.

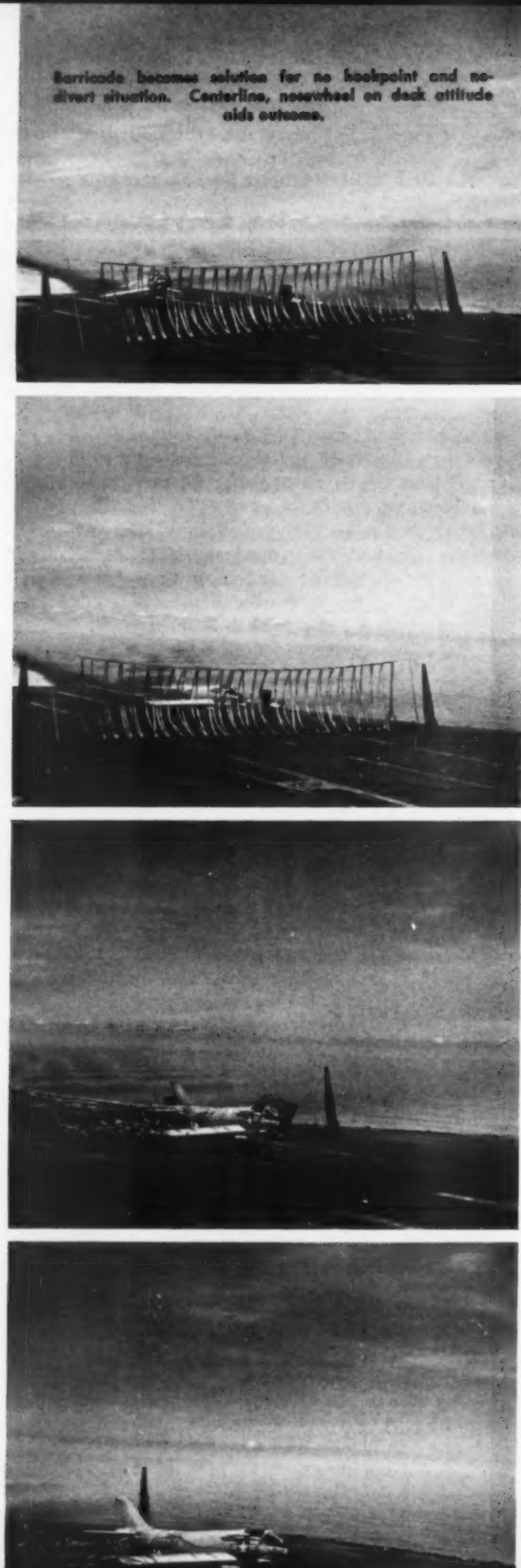
In an actual emergency, when the only warning to the crew is their very firm opinions about each pilot aboard, 5 minutes is good time. Add 40 knots WOD, turn off the sun, and sprinkle in a little rain, 10 minutes is good.

Steps to keep rigging time low start with drills. This is also a fine time for pilots to see the barricade first hand. The AG crew will appreciate your interest, too, and you'll have a better appreciation of the work they do.

At night all the light that can be brought to bear will help. WOD may not be subject to much control but obviously least is best. The bull horn can help by providing all the manpower that can be used.

Once up the barricade provides extremely reliable service. It's even claimed by the engineers that it will stop anything that stays under the top strap provided only that it is properly rigged, engaged close to on-center, and not engaged at an angle. The three failures that have occurred violated one or more of these conditions. The 50 or so successes didn't.

Please turn page



Barricade becomes solution for no hookpoint and no-divert situation. Centerline, nosewheel on deck attitude aids outcome.

Maybe you've seen the slogan "When all else fails, try reading the directions." Here are some directions that may help:

1. *Be on center.* This should mean way out, if you've been listening to your LSO. Late line-up is verboten with barricades just as it is on normal passes. The A4D picture may give you the impression that it's okay to engage sideways. But look again. He's right down the center line. He right-faced because the strut picked up a wire. Late corrections which result in an engagement while angling across the deck won't hurt the barricade but you may make the catwalk. One F8U tried this and wound up hanging over the side. Fortunately he was able to step out before the plane went swimming, but you might not be so lucky.

2. *Make a normal approach,* or at least the closest to it you can. No extra speed, please. Bolters and barricades don't mix. Stay on speed and on glide slope. If you're faced with a flaps-up or wing-down situation, deduct WOD from the approach speed you have to maintain. If the engaging speed calculated is beyond the recovery bulletin, try more WOD or less approach speed. If this doesn't work, consider the nearest runway. Failing that it may be suggested that nylon makes good parachute material, too.

3. *Aim at a normal touchdown point* with the meatball in the center. The barricade won't object if you light down aft of No. 1 wire but the LSO will.

4. *Anticipate the meatball doing a disappearing act.* It will be obscured by the barricade stanchion, as the picture shows. Two meatballs will help, if your ship has them.

5. *Drop your hook.* It can't hurt, and may help by lowering the speed at which you enter the barricade. It will also help to keep you on deck by minimizing any tendency to bounce. About half of all barricade engagements include a hook or wheel stub picking up a wire. There have been no cases in which either hurt.

6. *Drop all stores, if possible.* If not the engagement won't suffer, but the stores may be torn loose and ricochet around a bit. If you can't get rid of them, let the ship know so all hands can stay out of sight. If your A4D main gear hangs up, and you can't bingo, you may want to consider using empty tanks, rocket packs, or lightweight inert stores as a cushion.

7. *Canopy closed.* The one exception to this is the A3D top hatch, which should be locked open.

These general rules apply to all planes. The following specific rules for each type also apply (for Mk 7 arresting gear):

## BARRICADE DATA BY MODEL AIRCRAFT

| Model | Engaging Speed Limit | Max. Distance Off-Center | Comments |
|---|---|---|---|
| A3D | 110 kts for up to 46,500 lbs | 10 ft | Top hatch open as nosewheel may fail and prevent exit via lower hatch; fire hazard may exist from damaged electrical and hydraulic lines in wing. |
| A4D | 105 kts for up to 12,000 lbs | 10 ft | Nosewheel on deck as enter barricade. |
| FJ | 102 kts (FJ-3), 110 kts (FJ-4) for up to 16,000 lbs | 20 ft | Nosewheel on deck; speed brakes in or out. |
| F3H | 105 kts for up to 24,500 lbs | 15 ft | Nosewheel on deck. |
| F4D | 110 kts for up to 19,000 lbs | 10 ft | Main gear on deck. |
| F8U | 110 kts for up to 20,200 lbs, except 115 kts on CVA-43 and later ships. | 10 ft | Nosewheel on deck. |
| F11F | 105 kts for up to 17,000 lbs | 10 ft | Nosewheel on deck. |

All of these airplanes, including the A3D, have made successful barricade engagements. It may not be as easy as a blue card approach to a 12,000-foot runway, but since others have done it, and since you're the best naval aviator around, why you can do it too, if you have to. In fact, the F4D we left a few minutes ago just came aboard. No strain!

*Latest barricade news—The second successful A3D barricade engagement occurred on board* SARATOGA *on 14 December. And it was made under most unfavorable conditions. The barricade was rigged at night in winds which were gusting to 54 knots. Rigging time was 3½ minutes. Not only did the aircraft not engage a wire, it bounced aft of the number one pendant and flew into the barricade! Substantial damage resulted when the nose wheel failed. There were no injuries.* ●

### Recovery Bulletins in Effect as of October 1960:

| | |
|---|---|
| Mark 5 Mod 3 (CVS except 36, 39, 45) | 1-1C of 15 March 1960<br>1-2D of 15 January 1960<br>1-3B of 19 January 1959 |
| Mark 7 Mod 1 (CVA 11, 14, 16, 19, 34, 38, 41, 42, 59, 60) | 2-1A of 15 March 1960<br>2-2B of 15 January 1960<br>2-3 of 27 April 1959 |
| Mark 7 Mod 2 (CVA 43, 62, 63, 64, 65) | 4-A of 21 December 1959 |
| Mark 7 Mod 2 with sheave dampers (CVA 43) | Preliminary Bulletin #7 of 15 August 1960 |
| Mark 7 Mod 1 with sheave dampers (CVA 31, 61) | Preliminary Bulletin #8 of 10 October 1960 |


**O**UR P5M crew had the SAR duty and were dozing in the ready shack when we were roused at 0400 to go investigate an unidentified contact off the coast. Speed was essential; the pilot was briefed while I, as 3rd pilot, started the engines and got it ready to put over the side.

At 0430 we were water taxiing. It was Sunday morning and the harbor was packed with ships in for the weekend—our task was complicated by the traffic jam. Weather was miserable for this job. Heavy rain, high winds and 500-foot ceiling were all added to a very dark morning. We didn't have a full ration of seadrome lights either, and the crash boat was unable to rectify this part of the situation.

A request for an east to west takeoff was refused. The alternative was a west to east direction but this would aim us at the city and as soon as we broke water we would have to make a sharp right climbing turn in conditions of low visibility and ceiling. About 10 to 15 minutes had been consumed with engine runups, checklists, and discussion with the various control agencies.

After all this was out of the way, there remained the problem of taxiing down to the new takeoff position and the crash boat finally led us there. We had finished the takeoff checklist minutes earlier and as we started the run I felt uneasy and took a quick look around. Everything seemed in order. I fired the jato bottles in pairs at 50 to 65 knots. The run became very uncomfortable. At 85 knots the PPC tried to lift off to no avail and got the same results at 90 to 95 knots.

Screaming past the submarine tender at 100 knots, still on the water, I quickly put the reverse release lever down on my own initiative; it was obvious we would never get off the water. The PPC immediately followed by putting the props into full roaring reverse. The last thing I saw before the water spray closed off our vision were the lights of the water front rushing at us.

Smoke from the still firing jato bottles mingled with water spray. The jato and engines created a crescendo of sound. We were scared.

When the water cascaded off the windshield we saw we were stopped between two piers. The

*The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.*

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

last two bottles were still roaring back aft. People on the docks must have thought the sky was falling.

Taxiing back up the sealane the tower asked if we were Okay and we were able to put out a short "affirm." The cockpit was the first place to check for something wrong and we found it. After the takeoff checklist was completed and before the attempted takeoff, one of us had pulled the flaps up. This was due to the long taxi down to the takeoff spot. Flaps hinder taxi control and they must have been raised unconsciously during the trip. Following that discovery the after-station reported the port hydro-flap stuck partially open. The combination was enough to have prevented the takeoff even at 100 knots.

Having expended our supply of jato and courage we quit for the day, or rather morning. The combination of a previous week's round-the-clock exercise, urgency of the flight, confusion over clearances, plus the irritation of a GCA being made on Guard channel, all acted to break our usual meticulous cockpit procedures. Don't short-change checklists or get too irritated.

## INHERENTLY SAFE

PROFICIENCY flying is not always "inherently" safe even though it may seem so from the operational pilot's point of view. In some proficiency billets too much time elapses between flights and actual instrument hops are almost nonexistent.

My story begins with a lucky assignment as plane commander of a UF-1 for a weekend cross-country. Both the copilot and myself were qualified with about 300 hours in model. The morning of the takeoff was miserable. Low scud, visibility 2 or 3 miles, an estimated 700-foot ceiling and unexpected, unforecast, unreasonable snow flurries. After considerable conversation with the weather guessers, and a 30-minute delay for the visibility to open up to three miles so our clearance could be signed, we bounded out to the plane.

All checks went according to the book and a nearby radar unit assured us of a pickup after takeoff. The takeoff was a beauty (I was acting as copilot in the right seat) and then the fun began. The ceiling turned out to be 300 feet and we were in the soup before we had 110 knots.

We had vaguely discussed (mistake number one) that we would climb straight ahead to 1000 feet or until radar held us. However once in the soup a gentle left turn commenced toward some 500- to 800-foot towers. In response to my query for "Flaps up?" I thought he nodded approval (mistake number two) so I pulled them up. Airspeed dropped off and a right turn started, getting steeper all the time.

As I looked up from taking care of normal cockpit procedures I saw we were in a 45-degree bank to the right, airspeed 109 knots, altitude 350 feet. To complicate things I realized I had vertigo. Worse yet, the man with the controls also had vertigo.

Being afraid to take over control in my condition, and being equally afraid of our precarious position I started talking. I talked and talked and talked. Slowly the wings rolled level, the altimeter ceased its sink and the airspeed needle began a satisfying increase. Cockpit tension eased away and we continued climbing out straight ahead until radar picked us up. Then we proceeded on our normal, routine, uneventful proficiency flight.


## HUNG UP

I WAS returning from one of the many long hops my squadron flew during our Med deployment and I had one thought in mind—get my tinkertoy terror (A4D) on deck and relax my poor aching body. I broke with a correct interval on the plane ahead and dropped the boards while reducing power to about 78-80 percent. Gear and flaps came down at 180 knots.

Gear indicators were checked at the 180 spot and I started a turn towards the ship while still slowing. As the desired approach speed of 130 knots came up I eased on a little gun to check deceleration. Lucky me that I've flown this bird awhile!

I've heard most of its odd little noises and something just didn't sound right in the coffee-grinding section of my 'ole J-65. Au-

tomatically I added more throttle and moved the eyeballs into the cockpit to check. I discovered I had 110 knots and 80 percent.

Full throttle was applied but no increase in rpm showed up. My little bird was settling fast—only our CAG policy of a downwind minimum of 700 feet kept my feet from getting wet. I hit the manual fuel switch forward with the go-handle two-blocked. Believe me, the forthcoming shudders, roars and groans were nowhere near as impressive as the also immediately forthcoming rpm increase.

I picked up enough airspeed and the rest of my pass to a trap landing was normal. Moral: Yes, it's been advertised before —*Do* check your A4D for hangups which seem to go hand in hand with JP-5 and extended high altitude flights. *Don't* hesitate to use manual fuel at any time you doubt the working order of your fuel control.

## CROWDED

AT A large East Coast air station I was landing a WV-2 out of a GCA with 300 and ¾ weather. GCA cleared me to land and after touchdown I saw an S2F approximately 800 to 1000 feet directly ahead of me at a runway intersection. I didn't think I could get around him but I put power on No. 1 and 2 and nose wheel steering as far over to the right as I dared. Lastly I picked up my left wing with what aileron was left and headed for the side of the runway, intending to take the grass if necessary.

I didn't know whether I hit him or not but having passed, I swerved back to the center of the runway. Crewmen confirmed that my left wing went over him. The copilot of the S2F also confirmed this, adding that the first they saw of me was my wing passing over them.

The S2F had been cleared into position for takeoff. The tower people evidently *thought* the S2F could line up at the head of the runway not *ahead* of me at the *intersection*. It also became apparent that the controller watch was being changed which added some element of confusion.

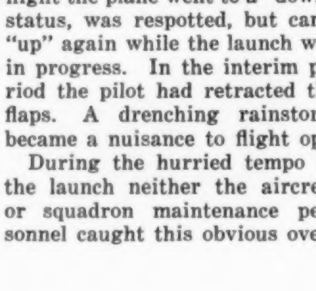
The visibility was the largest factor in the confusion. Actually it is doubtful whether the tower operator could clearly see the intersection. The S2F pilot positively stated that he visually cleared the runway in both directions before taking the runway. I must have been somewhere between touchdown and 50 feet in the air at this time.

Summation: The tower tried to hurry things when it was a time for deliberate action—total IFR inbounds and outbounds do not create a demand for max use of the runway.

## FLAPS-UP TAKEOFF

JUST prior to a launch from a large CVA an A3D was spotted on the catapult. During preflight the plane went to a "down" status, was respotted, but came "up" again while the launch was in progress. In the interim period the pilot had retracted the flaps. A drenching rainstorm became a nuisance to flight ops.

During the hurried tempo of the launch neither the aircrew or squadron maintenance personnel caught this obvious oversight and the big bomber was pulled up to the cat and shot off with the flaps up. The system of launching only after passing a positive "up" signal from the senior aircraft inspector to the cat officer was violated.



The A3D settled dangerously near the water, described as dropping off the flight deck by some, and gradually and painfully gained speed and altitude. Fortunately the launch was made in accordance with current bulletins, plus the CVS's established 15-knot J-factor.

To eliminate the possibility of a recurrence, the carrier tightened up its aircraft "checker" system and provided the responsible aircraft inspectors with black and white checkerboard flight deck jerseys.

## WHEELS WAIL

WHAT is the safest plane in the Navy? If you named the venerable old P2V you might get an argument from some of the "you-call, we-haul" boys, but when it comes to operational types she's hard to beat. The P2V has only one major bug: She isn't people proof.

The heroine of this tale was providing proficiency services for two PPCs practicing simulated single-engine landings. Throughout the run everything seemed routine and the final approach put us in good shape to land. It was here that the bow observer left his station to voice his doubts. Crawling out of the nose tunnel he tugged at the plane captain's coat tails and asked, "Say, we're not going to land this pass are we?"

"Of course," came the answer. "Why shouldn't we?"

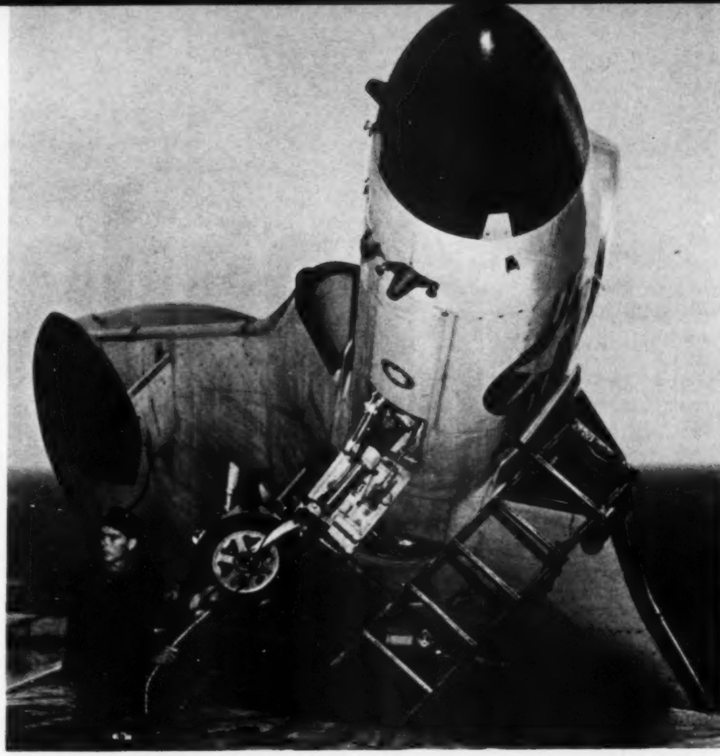
"Because the gear isn't down!"

Sure enough, two PPCs and an experienced plane captain came within inches of planting a P2V right on its radome. ●

# YOU WRITE THE CAPTION!

And don't take too long either. That big man and little ladder are going to get mighty tired of holding on to the heavy *Ford*. Send your caption to APPROACH and we will print the best ones with credit in a future issue.

While you're writing, include a safety suggestion. Maybe you can come up with some ideas on how we can keep birds like this one from crawling over the side.



# TEST QUESTIONS ON ALTIMETRY

*Answers on page 48*

1. An aircraft parked on a 1000′ field has its altimeter set at 30″ and is correctly indicating the field elevation. What would the altimeter indicate if the setting is changed to 31″?

2. The pressure at a station decreased ½″ overnight. Did this cause the altimeter readings on parked aircraft to increase or decrease? About how much?

3. A transoceanic flight operating at a 2000′ pressure altitude is cruising over a 28.86″ low pressure area. What's approximate true altitude of the plane?

4. A pilot coming in on an instrument approach is given an altimeter setting of 29.84″ but inadvertently sets his instrument at 30.84″. If the field elevation is 500′, approximately what altitude above sea-level did the instrument indicate when his wheels touched the ground?

5. An aircraft is cruising at 5000′ indicated over a sea-level station with an outside temperature of 10°C. What is the true flight altitude?

6. An aircraft is cruising at an indicated altitude of 8000′ with an outside air temperature of —10°C. The station to which the altimeter is set at 2000, altimeter setting 29.92″, and the surface temperature is 50°F. What is the true altitude of the aircraft?

What is the absolute altitude?
What is the pressure altitude?

7. An aircraft was cruising on instruments indicated altitude of 12,000′ over a station of 6000′ elevation. Due to loss of radio, the aircraft altimeter setting was 1.00″ higher than that reported by the station. If the observed temperature at the cruising altitude was —22°C, what was the true altitude of the aircraft above sea level?

8. A group of planes based on an airport of 12,000′ elevation is ordered to take off immediately and rendezvous at an altitude of 400′ above a nearby coastal plain which is at an elevation of 600′. There is no altimeter setting available for the coastal plain, but the temperature at its surface is 86°F. Due to weather conditions the descent has to be made entirely on instruments. If the group proceeds to carry out the instructions literally without changing the altimeter setting, what would be its true altitude above sea level if it arrived at the requested indicated altitude?

*—Courtesy E. J. Minster, TWA, and E. M. Russell, FAA.*

Have a problem, or a question?

Send it to

# headmouse

he'll do his best to help.

- Mail your questions to:

HEADMOUSE

U. S. Naval Aviation Safety Center

Norfolk 11, Virginia

## Instrument Procedures

Dear Headmouse:

After having torn the office apart, all to no avail, I am again writing you in quest of answers to some questions on instrument procedures.

Where is it stated:

1. In Navy publications that, when on instruments, a 30 degree angle bank will not be exceeded?
2. That, on an approach plate, the part depicted by dotted lines will be flown in the penetration configuration and that part depicted by a solid line will be flown in the final approach configuration?
3. That a full standard rate turn will be utilized on final approach and missed approach?

One more question, do you know when the All—Weather Flight Manual will be re-written?

O. G. MCDONALD, CAPT, USMC

TraRon 21
NAAS Kingsville, Texas

► 1. Headmouse was unable to find any written word that restricts or prohibits making a 30-degree angle of bank or greater when flying on instruments. Quoting from the All-Weather Flight Manual (NavAer 00-80T-60) page 8-24, "Any turn with an angle of bank greater than 30 degrees is considered a steep turn. This type of turn is *seldom necessary or advisable in routine instrument flight*. However, all-weather jet interceptors employ precise steep turns on instruments as a matter of routine. Therefore, the ability on the part of prop-aircraft pilots to perform these maneuvers on instruments as evasive action against all-weather jets is very desirable. A steep turn is also a good maneuver to increase your ability to react quickly and smoothly to rapid changes in altitude." In Chapter 9, page 16 it further states regarding jets, "At high true airspeeds, where more than a 30 degree angle of bank is required to maintain a standard rate turn (3 degrees per second) make a one-half standard rate turn (1½ degrees per second) to avoid steep banks."

Present FAA holding criteria establishes a maximum holding IAS for high performance aircraft at 250 knots above 15,000 feet. A proposal has been made to increase this to 300 knots. (Special holding speeds have been established for the F-104). The angle of bank required to maintain a one-half standard rate turn at high true airspeeds and altitudes above 15,000 feet must necessarily be proportionate, to keep the aircraft within prescribed buffer zones and may slightly exceed 30 degrees. When turns of over 30 degrees of bank are performed at lower altitudes and airspeeds, the pilot's basic airwork ability is severely taxed and the possibility of vertigo becomes much more pronounced. High drag turns at low altitude require careful power management and altitude control. (NASC has recommended to FAA that the holding pattern area — high altitude — be increased to permit turns at 30° left of bank or less.)

2. The reference for this answer is the U. S. Manual of Criteria for Standard Instrument Approach Procedures, Sept. 1, 1956 and OpNav Inst 3722.16.

The penetration track (dotted line) may be flown in either the clean or dirty configuration depending on the profile gradient requirements. In the case of the penetration track inbound, a *buffer* or *clearance* zone is provided that extends 4.34 miles on either side of the final approach radial. This zone is constant from 20 NM outbound and reduces to 2 NM at 12 miles and ½ NM at the facility. This allows the pilot a greater maneuvering latitude and depicts the approved flight path. The solid line (procedure flight path) of the final approach must be an established radial or bearing to insure low altitude obstruction clearance and runway alignment as well as visual reference with the intended landing area at standard minimums. Obstruction clearances at this stage in the final approach corridor range from 1½ miles either side of the approach course at 7 NM to ½ mile at the facility or airport. The point at which the final approach configuration will be attained is usually determined by the low gate position, but should not be less than two (2) minutes from the airport.

3. Under positive radar control on the final approach (not

glide path) standard rate 3 degree per second turns should be made. Under GCA approach procedure technique the All-Weather Flight Manual says, "Make all turns as near standard rate as possible . . ." (pg. 20-6)

Missed approach patterns involve areas of minimum obstruction clearance and should be executed with turns not less than standard rate.

4. The All-Weather Flight Manual interim revision has been completed and is now at the printers. This interim revision is a general updating of the manual incorporating the desires of the Fleet and Training Commands. A complete rewrite and rehash of the manual is contemplated by the Advisory Committee for the Navy Standardization Board sometime in late 1961.

Very resp'y,
HEADMOUSE

## Approach Minimums

Dear Headmouse:

In the September issue you published and replied to a letter concerning approach minimums. It would appear from your comments that Change 2 had not been incorporated in your copy of OpNav Instruction 3720.2A.

You state, "The minimums in 3720.2A are indeed clearance minimums, and according to 3721.1C, ' . . . are predicated on pilot/aircraft limitations and are solely the pilot's responsibility to observe.' Once you're in the air, the published minimums normally apply."

Paragraph 2.b of 3720.2A as changed by CNO dispatch 091758Z June 1960, reads in part, "For jet aircraft an instrument approach shall not be commenced when the weather is below minimums prescribed in paragraph 3a below."

L. A. LONO, CAPT., USMC
Instrument Training Officer
VMT-1

Dear Headmouse:

We believe that examination of OpNav Notice 3720 (Change 2 to OpNav Inst 3720.2A) and OpNav Notice 3710 (Change 3 to OpNav Inst. 3710.7A) will clear up the haze concerning approach minimums noted in the September APPROACH Headmouse column.

According to OpNav Inst 3720.2A, section III, paragraph 2b and 3a, and OpNav Inst 3710.7A, section VII, paragraph 3g, Capt McDonald, flying a single-piloted aircraft (jet), cannot *commence* a GCA (PAR) approach if the weather is below 200 feet ceiling and ½ mile visibility. In a single-engine prop, he could commence the approach at less than the above minimums (down to 100 - ¼) *only* if he has enough gas to make the alternate in the event of a missed approach. In the case of an OMNI, TACAN, ADF, ASR or LF approach to destination, published minimums apply for multi-piloted aircraft, but single-piloted aircraft add 200 feet to published ceiling, and require not less than one mile visibility.

At the alternate, the problem of weather minimums to commence a legal approach is again compounded by the type of approach and by type aircraft (single or multi-piloted). Since these minimums, which now apparently apply for commencing an approach as well as for clearance, are not contained in any of the FLIP pubs, and have proven difficult to remember, we are adding another kneepad card to the growing list required to meet the IFR regulations. Several "single piloted" pilots in the squadron have solved the space problem by flying with *two* kneepads, one for tactical flights (small) and the other for IFR flight (large). Our safety officer is getting concerned over the fire hazard inherent in this type operation. Any suggestions?

T. S. ROGERS, JR., LT.
VX-4 Flight Officer

Dear Headmouse:

. . . The meat of the problem is that a single-piloted recip can commence his approach with weather below the criteria listed in OpNav Inst. 3720.2A whereas a jet cannot. Once they commence the approach in accordance with 3720.2A, they are again on equal footing.

Looking at the problem from the radar controllers' viewpoint, current instructions require that the controller and approach control issue the current weather to the pilot prior to his descent but the pilot must determine whether he desires to commence an approach or not. Likewise, the pilot must determine what minimums apply to him in each particular case. The PAR or ASR minimums broadcast to the pilot during his approach and the point at which he reaches these minimums are based entirely upon the field, terrain, obstructions, radar accuracy, etc., and have no bearing upon the type of aircraft being flown.

RATCC NO. 35
NAS Oceana, Virginia

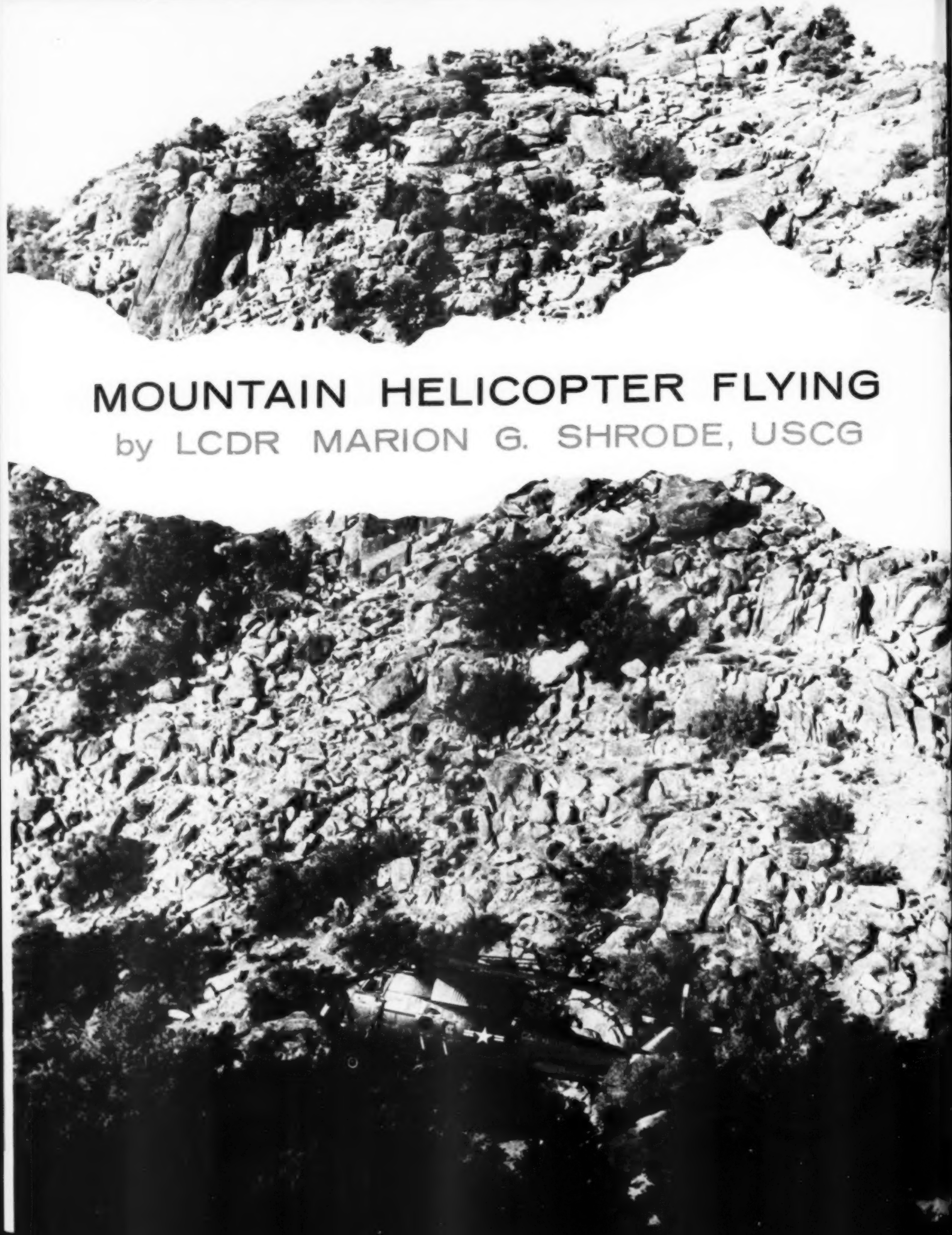
► Headmouse is willing to stand by the answer given in September APPROACH. Change 2 to OpNav Inst 3720.2A had been incorporated before the answer was published. Since Capt. McDonald in his original hypothetical "f'rinstance" failed to specify whether or not the single-piloted aircraft filing for NAS RO2N was jet or prop, editorial license was invoked in assuming it to be a reciprocator which had the fuel capacity to proceed to the alternate if a missed approach was necessary. With this assumption the pilot may *commence* his approach at NAS RO2N when the weather is between published minimums, 100-¼ and 200-½ (e.g. if it is 150-⅜).

It is true that OpNavInst 3720.2A is open to interpretation as to what constitutes approach minimums for a single-piloted aircraft making a PAR approach. However, *it is CNO's intent that the clearance minimums listed in paragraph 3a Section III of 3720.2A also apply as approach minimums.* Therefore, at NAS R02N the hypothetical pilot must level off at 200' if he does not have the runway in sight. (It is realized that many naval aviators are interpreting 3720.2A to read that a single-piloted aircraft may descend to published minimums; because of this the Safety Center is recommending to CNO that this part of the instruction be clarified.)

In any other set of circumstances—jets, not enough petrol, etc.—the approach cannot be commenced when weather is below 200-½ as indicated in both of the above letters.

The paper bulk problem is a knotty one and Rogers' solution is as good as any.

Very resp'y,
HEADMOUSE



# MOUNTAIN HELICOPTER FLYING

by LCDR MARION G. SHRODE, USCG

THE three West Coast Air Stations are all located in close proximity to widespread bonafide mountainous terrain. All these stations operate helicopters, and all have had their sad tales to tell where pilot and machine met mountain and came off loser. Because of the infrequent nature of high altitude helicopter operations, it was quickly apparent to these stations that both the incidence of aircraft damage and lack of pilot training were excessive.

Now, we all know that helicopters can and do operate safely to considerable mountain altitudes. A while back, two Turkish Air Force pilots successfully landed and took off from a 14,500-foot peak to recover top secret documents from a crashed plane. To be honest, their landing was somewhat of a controlled crash, and the takeoff was accomplished simply by rolling the machine off a cliff, but the mission was completed without damage to the aircraft—because they knew what they were doing. Lucky, too, perhaps, but the fact remains that these officers had been thoroughly trained in all aspects of mountain flying at Stead Air Force Base, Reno, Nevada.

Stead, one of the several Air Force bases engaged in basic and operational helicopter training, is unique for a helicopter training base in that its field elevation is 5000 feet. With adequate high terrain in great abundance, the Air Force students are given mountain training as part of their basic qualification syllabus. In this manner, Stead's instructors feel that even a marginal student qualified through their instruction will prove more than adequate when lowered to sea level. So, when the pilots at CGAS, San Francisco, were searching for ways and means of instituting a mountain helicopter training syllabus, the proximity of such a source of instruction provided the opportunity for some really professional training. Through mutual agreement between units, a two-day course of instruction was obtained for a limited number (10) of qualified pilots, with a graduation party at Harold's Club in Reno thrown in for fraternizing purposes.

The quality of instruction at Stead was very fine indeed. Both in ground school and flight, the instructors were competent and enthusiastic. The first day of training was spent totally in the classroom, learning the planning and theory from which is derived the physical methods and techniques basic to mountain flying. Here, at last, were positive measures, evaluated and accepted through experience, that eliminated the guesswork and uncertainty from high altitude operations. The second day was strictly for flying—putting the planning and theory to test.

It is not the intent of this article to give more than a brief resume of the many points covered in the course. Such items included basic planning, use of handbook data, power checks, RPM control, approach procedures, site evaluation, wind currents, turbulence, blade stalls, and other pertinent matter. Landings were made at altitudes up to 8000 feet, and in restricted areas with high obstacles. From this instruction, this unit has been able to compile a useful and practical mountain training syllabus. For the benefit of the service at large, several of the basic methods used will be herewith discussed in detail, as it is felt that such knowledge can be immediately put into application by all believers, and at least put to trial by the skeptics.

In Ambrose Bierce's "Devil's Dictionary," the word "Accident" is defined as "an inevitable occurrence due to the action of immutable natural laws." In mountain flying, there are situations and circumstances that will indeed make an accident inevitable if the pilot does not have the knowledge and understanding of the natural laws involved. Therefore, preflight planning is an absolute prerequisite to determine the capability of the aircraft to meet the required performance. This establishes the Go, No-Go limits that preclude the inevitable occurrences. And if No-Go is established, the direction of alternate action may well be indicated by the pre-planning, i.e., lighter loading, alternate (lower) landing areas, . . . The source of data for preflight planning is Appendix 1 to USAF Flight Manual for H-19 helicopters (T.O. 1H-19B-1) [Navy HRS type], and all available current weather information.

Using the above-mentioned appendix, the first step in the preflight planning is to determine the maximum gross weight for hovering out of ground effect (Figure A-9). If the aircraft weight does not exceed the weight thus determined, a landing at the desired site can be made regardless of obstructions, because a vertical approach can be made if necessary. If, on the other hand, it is known that a normal approach can be made, then the weight can be computed by using the A-5 (Power Check) chart. This chart was designed to determine the power required to hover at a given weight, but if used backwards it will give the maximum weight at which the aircraft will hover with the power available. Power available is obtained from the A-6 (Engine Performance Curve) chart at the desired pressure altitude. And note that pressure altitude, rather than density altitude, is used to enter the charts, with a correction for

temperature included in chart A-5. If no valid weather information is available for the destination, then use of certain known fundamentals of meteorology can predict the conditions on scene with reasonable accuracy for planning purposes, providing the departure point and destination are both in the same predominate pressure system. Thus can be determined prior to flight if there will be sufficient power for the helicopter to successfully perform at the weights required by the mission.

The foregoing determination, however, is only a prediction, and variances of on-scene weather and fuel consumption can invalidate those predictions. The pre-planning, therefore, also consists of an inflight phase. This requires a power check to positively insure that the required power is available. This check was developed at Stead from flight tests and precludes any errors which may have been present in the ground pre-planning. For description of this check, I quote directly from the Stead AFB Standardization Guide:

"Power Check.

"(1) Fly the aircraft across the landing site at a safe altitude. This altitude will vary with wind velocity, obstructions, terrain, etc.

"(2) As the point of intended landing is approached, establish 2400 rpm, 20 knots IAS and keep the aircraft level over the point of intended landing. Note the manifold pressure required. Make sure that the aircraft is not accelerating, decelerating, climbing or descending during the check. After the first phase of the power check is completed at 20 knots, establish a normal climb (50 knots). Maintain 2400 rpm and determine the maximum manifold pressure available. The difference between the manifold pressure required on the power check and maximum manifold pressure available is the power differential. *The minimum power differential required to bring the helicopter to a one foot hover is 5" Hg.* This is with an internal cargo load up to 10,000 ft. density altitude. Above 10,000 ft. density altitude 6" Hg. will be required. Five inches Hg. is the minimum power needed for a no wind landing. Under this condition, any abrupt movement of the controls will probably cause a loss of rpm.

"(3) An accurate power check becomes harder to obtain as the wind increases in velocity or turbulence increases. If the wind velocity increases above 20 knots, fly a ground speed of approximately 10 knots instead of 20 knot IAS. This will not be as accurate as flying a 20 knot IAS, but should give a good indication of the power differential.

"(4) If the wind is fairly calm, and the turbulence mild, the power check is rather easy to accomplish. As the wind increases in velocity, more thought must be given to downdrafts and the approach to the power check should be made steeper to avoid these down drafts. In winds from 10 to 20 knots, a null area will usually exist over a knoll or hilltop. The power check should be accomplished in this null area since it is usually where the landing is made.

"(5) The power check will only indicate if hovering will be possible and not the height of the obstruction that can be cleared on takeoff. The power check should be made at a safe altitude above the trees or other obstruction. Do not count on winds that may be present during the power check for they will usually be lost when below tree top level."

Now we have a basis for preventing the inevitable occurrence. From here on, it's a matter of pilot technique. There is no substitute for actual experience, and such experience cannot be supplied by this article. However, quoting again from Stead's Standardization Guide, here are listed ten pertinent points of wisdom on Approach, Hovering, and Landing under marginal performance conditions:

"(1) The type of approach and approach techniques will vary in almost every situation. The pilot should plan his approach and takeoff to avoid obstacles and effect the safest possible approach and departure under the existing operating conditions.

"(2) When operating at or near maximum computed operating weight with marginal performance conditions (due to altitude, temperature, humidity . . . ), proper technique will improve the helicopter's performance. Smooth coordinated movements of the controls are essential, and any tendency to overcorrect or move the controls in a sharp or abrupt manner should be avoided. An increase in power must be accomplished by increasing the throttle before increasing the collective pitch. By leading with

### Mountain Helo Ops

The pilot had made two previous landings at the accident scene, the last about one and one-half hours previous to the accident. During the pilot's absence, a cable had been strung. The pilot was unable to see the cable and was not warned of its presence. His approach and landing were normal until touchdown when the main rotor blades made contact with the cable. The aircraft swung violently to the left and fell over on its left side.—*Canadian Department of Transport report*

the throttle, a loss of RPM will be less likely to occur. It is possible, under marginal conditions, to lose RPM to a point where it cannot be regained without reducing collective pitch. When such a situation occurs, the helicopter will usually settle. Therefore, it is very important to lead with throttle and to use the maximum recommended engine rpm.

"(3) A steep approach to a landing is extremely critical, under conditions of high gross weight or critical operating conditions. It is usually best to use a shallow approach, if possible. The maximum rate of descent should not exceed 300 feet per minute.

"(4) The terrain and obstructions will usually dictate the altitude at which the approach should be started. If it is possible, start the approach 100 to 200 feet above the landing altitude.

"(5) Turn onto final approach at a minimum airspeed of 40 knots.

"(6) The final phase of the approach is the most critical and requires a good judgment and smooth helicopter control. It should be accomplished with a minimum of attitude change (Author—no flares) and a smooth blending in of power. *RPM control is very important* and is difficult to regain if allowed to fall below 2400.

"(7) If the winds are fairly strong and steady, turbulence and downdrafts will present a greater problem than power loss. Due to the advantage gained from the wind, a steeper approach is usually the best type of approach to use. If the steep approach is used, strong downdrafts can be avoided and the pilot will be in a better position if a forced landing is necessary. If the landing area is sheltered by trees or other obstructions, use caution at the end of the approach. The wind will usually be less and rate of descent and ground speed will tend to increase as wind decreases.

"(8) Be alert for wind changes during the approach. If the helicopter is riding a gust on the final approach and the gust decreases as the helicopter is approaching a hover, the helicopter will have a tendency to "fall through."

"(9) Make all approaches to a specified point and not just a general area. The more confined the area, the more essential it is that the helicopter be brought to a hover over the intended landing spot.

"(10) Hovering and Landing.

"a. Bring the helicopter smoothly into a one to two-foot hover. A low hover requires a minimum of power, reducing the possibility of rpm loss and subsequent settling. In case settling does occur, the helicopter will touch down more gently from a low hover. In calm or light wind, make hovering turns to the right whenever possible: in this way the pitch of the tail rotor blade is reduced, thereby requiring less power. Land as soon as possible. Decrease the collective pitch slowly while maintaining 2400 rpm until the landing is completed. 2400 rpm should always be maintained until it has been determined that the surface will support the helicopter.

"b. Consider the diameter of the main rotor and continually be conscious of the tail rotor to insure adequate clearance. The angle of descent over a barrier must be such that the tail rotor will clear all obstructions. Exercise caution while on the ground to avoid swinging the tail rotor into obstructions."

I entertain no ideas whatsoever that this article, or even the two-day course at Stead, will make us all accident-proof. Mountain flying will continue to be a real sporting proposition, but, as in a Reno poker game, a sound knowledge of the fundamentals involved will enable you to know when to fold or when to call.—*USCG Flight Safety Bulletin.* ●

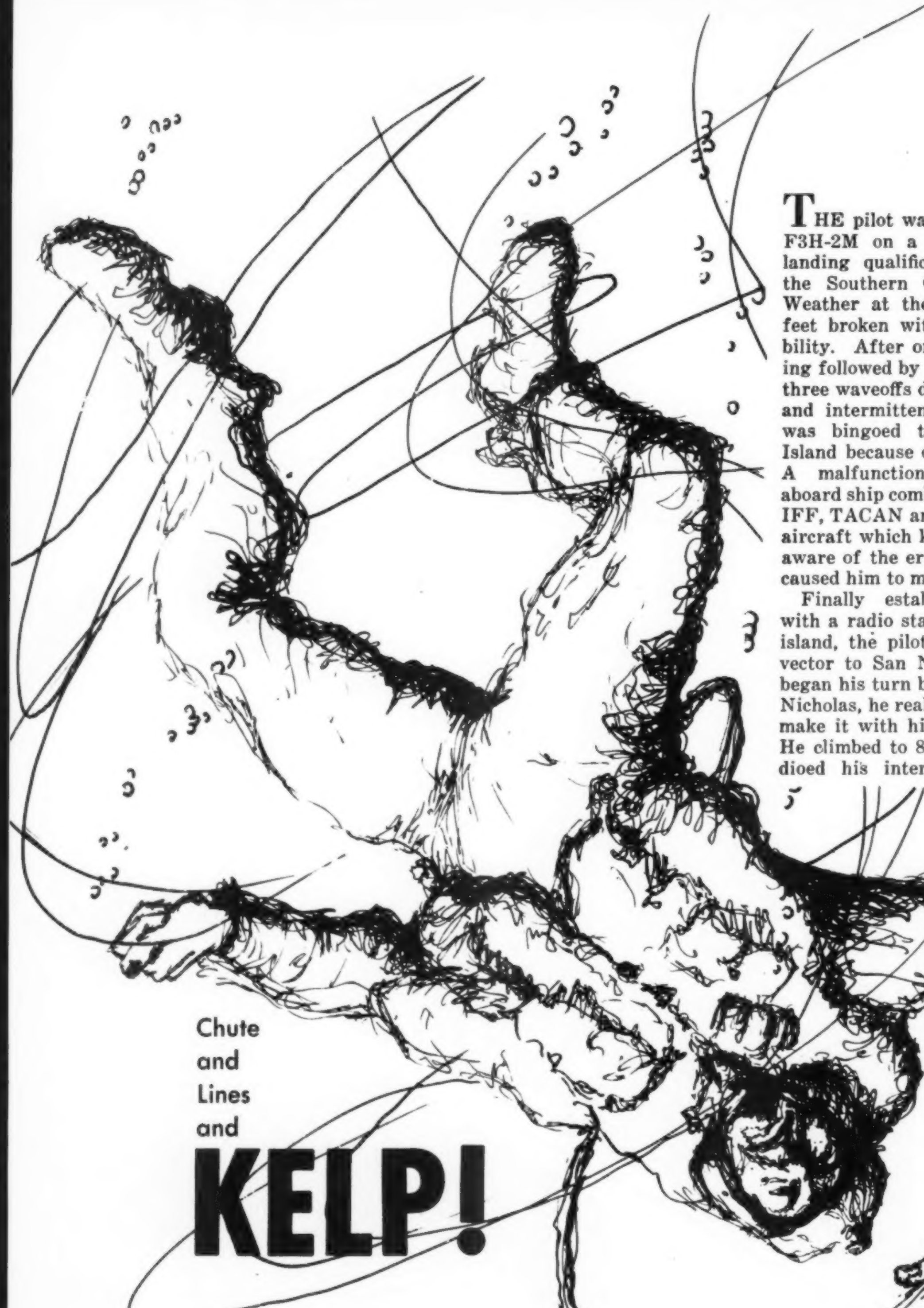
### Mountain Flying

**A recent HO4S-4 helicopter accident was the result of the aircraft entering a nose-high attitude with a resultant lack of collective and cyclic control reaction. The aircraft was flying at 250 feet above the ground, 75 knots airspeed, and was approaching a ridge of hills. Current investigative efforts have indicated no control malfunction. If no malfunctions are uncovered it can be assumed that the aircraft encountered an updraft which resulted in a blade stall condition.**

**It is desired that all helicopter pilots be made cognizant of the following basic flight safety factors:**

**► When flying helicopters where there is a possibility of encountering thermal conditions, including turbulence, over mountainous and hilly or irregular terrain, the necessity of maintaining sufficient altitude at all times should be emphasized so that recovery can be effected from any unusual attitude which may result from such conditions.**

**► In addition, helicopter pilots should be fully aware of the fact that, in the less dense air at higher altitudes, more altitude must be maintained by helicopters above the ground to permit safe recovery from unusual attitudes than that which is required at sea level.**



# Chute and Lines and KELP!

THE pilot was launched in an F3H-2M on a daytime carrier landing qualifications flight off the Southern California coast. Weather at the ship was 3000 feet broken with 10 miles visibility. After one arrested landing followed by three bolters and three waveoffs due to a foul deck and intermittent deck pitch, he was bingoed to San Nicholas Island because of low fuel state. A malfunctioning DRA plot aboard ship combined with faulty IFF, TACAN and ARR-40 in the aircraft which kept the pilot unaware of the error in his course caused him to miss the island.

Finally establishing contact with a radio station on a second island, the pilot received a new vector to San Nicholas. As he began his turn back towards San Nicholas, he realized he could not make it with his low fuel state. He climbed to 8500 feet and radioed his intention to get as

close to the island as possible and then eject. The pilot gave his MAYDAY and made final preparations for ejection. He ejected three miles from the island at 4500 feet altitude. Here is his description of what ensued.

"I disconnected my radio cords and oxygen hose from the aircraft receptacle, positioned myself in the seat, slowed the aircraft to 150-160 knots and then pulled the face curtain.

"Everything worked perfectly and I retained all personal equipment on the ejection. During the parachute descent I disconnected my bailout oxygen line, loosened the oxygen mask from my face and released the parachute harness chest buckle. I also removed the raft from under the seat pack as the raft lanyard was hooked to my mae west.

"I did not experience too much difficulty getting back into the seat. (This is something I've never been able to do in survival training.) I entered the water with my back to the wind. As I bobbed back to the surface, the canopy was still blossomed and started to pull me. I was facing the canopy on my stomach so I ducked my head into the water, unfastened the parachute harness leg ejector snaps, stretched my arms over my head and the harness pulled free.

"When I came back to the surface, I could look over my left shoulder and see the harness spinning away from me. I turned to my right to swim away and was caught by a swell that tumbled me underwater. When I came back to the surface, I found myself tangled in the shroud lines of the parachute and in a kelp bed. (Later, I estimated the swells to be 4 to 6 feet.) I had no trouble inflating my mae west or life raft, but was unable to get into the raft with the additional weight of the parachute. I wrapped my left arm around on the inside of the raft and pulled out my sheath knife which I had on my right lower leg. I spent the remainder of the time in the water cutting shroudlines, but I never did get my legs completely free. (At this time, I inadvertently cut the lanyard fastening the survival kit to the raft.)

"An S2F approached me from the island shortly after I had inflated the life raft. The aircraft had Point Mugu markings on the tail and was equipped with a megaphone (used to assist in clearing small boats from the missile range). I actuated a smoke flare as the aircraft approached. The pilot started talking to me and said he had me in sight and assured me that a crash boat and a helicopter were on their way. It was most reassuring to hear someone talking and to know help was coming. The aircraft remained over me until the crashboat arrived."

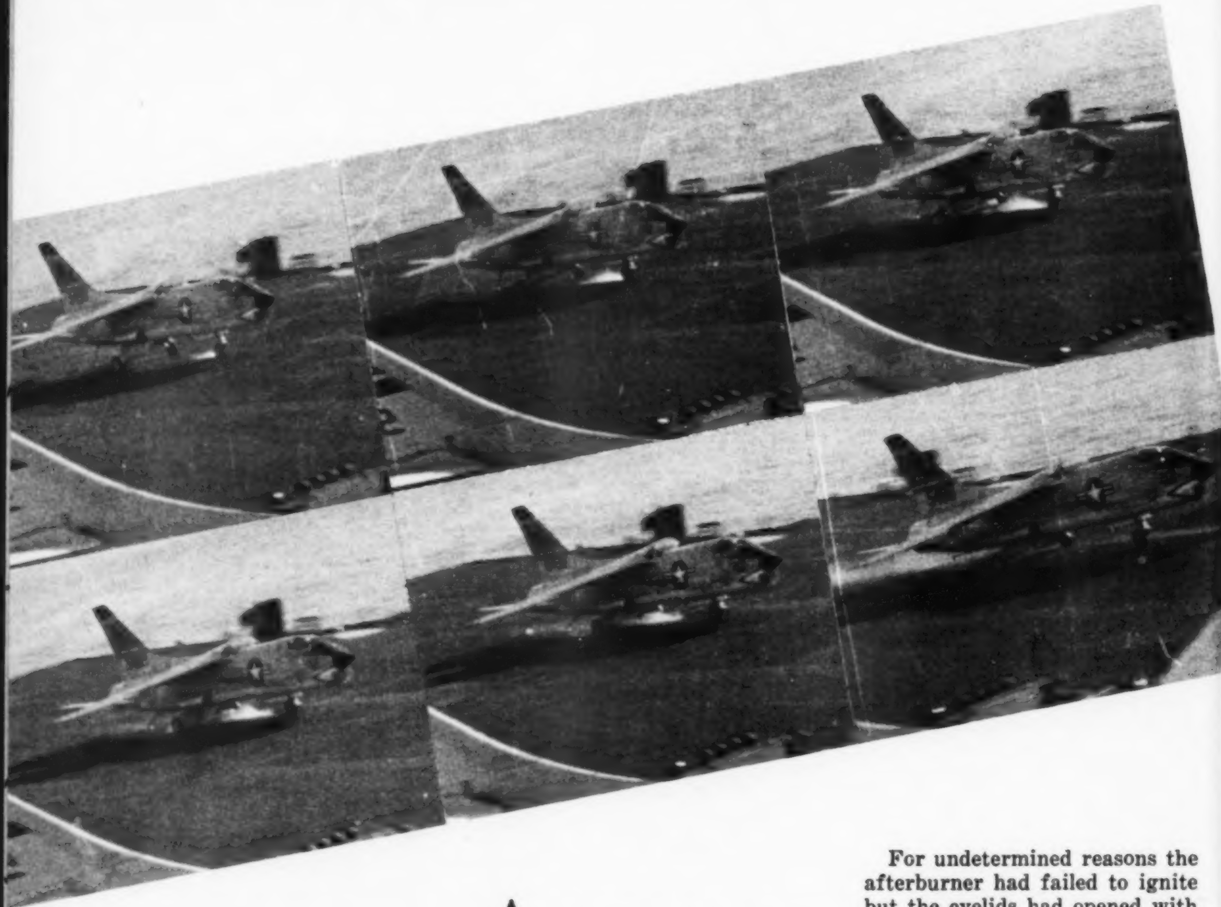
By the time the boat arrived, the pilot was finding it necessary to tread water with one arm and cling to the life raft with the other to keep the waterlogged parachute from dragging him under. Because of the pilot's fatigue and his attached parachute, one of the crash boat crew went into the water to help him. The crewman secured a line around the pilot and he was hoisted aboard, "parachute, kelp and all."

The pilot was suffering from mild shock and exposure from 45 minutes in 63°F. water without an anti-exposure suit. Examination later revealed that he also had a sprained back.

Four months before the accident, the pilot had attended a week-long survival training course. During the course, he performed an escape from a parachute harness while being dragged in the water and was "rescued" from the water by helicopter.

"It is apparent that the caliber of this training was excellent," the reporting flight surgeon observes. "There is no doubt that this training aided this man in his survival situation."

The flight surgeon recommends that the experience of extricating oneself from nylon parachute lines in the water be added to the training course. In his report, he also praises the efficient SAR operations implemented by the local Navy and Air Force GCI stations. ●



# THRUST RATING

As a section of F8Us was vectored on a practice intercept the wingman took a trail position. With afterburners operating the two pilots held supersonic speed for five minutes then dropped back to military power. When his speed stabilized the wingman again selected burner. It failed to light off. Two more attempts were unsuccessful.

Fuel state during this time was around 3300 pounds but shortly afterward a rapid loss of fuel came to the wingman's attention—1100 pounds in about three minutes—and he commenced a return to the ship in idle descent. The leader joined up and reported vaporized fuel streaming from the tailpipe.

For undetermined reasons the afterburner had failed to ignite but the eyelids had opened with fuel being sent to the spray bars. This situation left the basic engine thrust greatly reduced. How much power would be lost had previously been a point of debate; the flight manual said 20 percent, however, unofficial but authoritative information placed the loss at 50 percent thrust.

When three miles from the carrier, the *Crusader's* low-level warning light blinked ON (roughly 1200 pounds remaining). During his mirror approach the pilot noticed the power required (RPM indication) to stay on the glide slope was higher than normal.

As the aircraft continued toward the carrier a large amount of vaporized fuel was

streaming from the tailpipe which obscured the aft section. Hook position was not discernible from the LSO platform so . . . the first pass was a bolter. The hook was not down.

As might be imagined, the waveoff characteristics were very poor. After staggering straight ahead in a slight climb the pilot commenced turning downwind for another approach. The maximum available thrust was so low that when he introduced any angle of bank the aircraft would lose altitude. Gross weight at this point was approximately 19,100 pounds. Had the weight been significantly greater it is unlikely that a waveoff or bolter would have been successful.

A second approach, with fuel down to 800 pounds, was successful. After clearing the arresting gear the pilot secured his engine, following which, a fire broke out in the tail section. It was quickly extinguished by flight deck personnel and no damage resulted.

It was apparent to witnesses that the pilot rotated the plane to the maximum angle of attack which would sustain level flight with the available power; however this resulting performance did not measure up to what could be expected for 80 percent of military thrust. Thus the unofficial figure of 50 percent thrust with eyelids open and afterburner inoperative was considered more valid.

As a result of laboratory examination it was determined that the Afterburner Fuel Regulator Shutoff Valve was stuck in the open position. Upon its replacement the afterburner, including the Igniter Valve, functioned normally. No satisfactory explanation has been offered as to why it failed to ignite during the flight.

## Beauty and the Beast

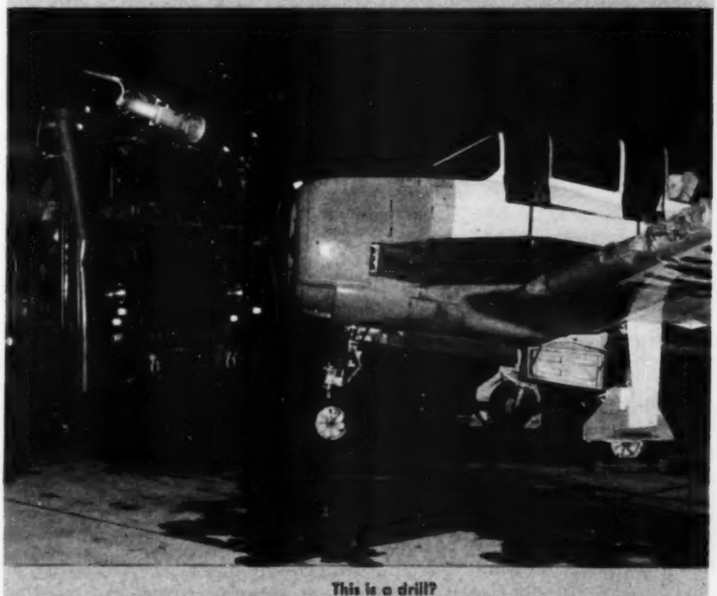
A CRASH fire drill was scheduled for early evening and a lineman climbed into the cockpit of a T-28 to simulate the pilot. The emergency bell sounded and location of the "crash" announced. An MB-5 was first vehicle to arrive at the scene.

The driver stopped short of the aircraft, facing it at a 45-degree angle. He placed the hand brake ON, pulled the turret operator's leg as a signal to have him leave the turret and assist in the rescue. After giving this signal the driver left the cab to rescue the pilot.

"I was taught," the turret operator stated, "that when riding turret and the driver hit you on the leg it meant start the turret. This I did. When I pushed on the turret pedal the truck started going into the plane."

The driver noticed his truck moving forward and jumped back into the cab, however, he was unsuccessful in preventing the truck from hitting the aircraft wing.

It was determined that upon stopping, the driver had failed to take the truck fully out of gear. When the turret operator pushed on the turret pedal to simulate action of foam this action caused an increase in the truck's engine speed and it started moving.



This is a drill?

**The difference between an incident and an accident is often a matter of luck. But luck is often a frail undependable thing and won't always let you come out smelling . . .**

# MIGHTY LIKE A ROSE

## Wet Deck

F9F-8T August Texas

Commenced takeoff immediately after passage of heavy rain shower. Approaching 115 knots, the aircraft ran through a heavy concentration of water on the runway. Airspeed dropped to 105 knots then increased back to 115. A second water area was met and aircraft decelerated again.

With more wet runway ahead the pilot aborted, shut down the engine and dropped the tail hook to hit the arresting gear at 80 knots.

*Recommendation:* Attempt no takeoffs during or immediately after rain showers. If takeoff necessary check on local knowledge of runway characteristics. Expect decelerating effect when passing through pools of water.

## Wrong Load

A4D-2 Rocket and Bombing Hop

FAGU rocket launcher on each outboard station and 250 pound bomb on centerline. On the pilot's two previous hops he had bombs on outboard stations. Though aware of new configuration he mechanically set up armament panel to drop bombs and on attack run depressed bomb button. As the two FAGU rocket launchers, fully loaded with 2.75 inert rockets, were ejected they struck and damaged the underside of both wings.

Pilot admitted "head-up-and-locked" condition. Made recommendation to make notes on kneepad as to ordnance by station rather than trust to memory.

## Fumble Fist

A4D-2 Duty emergency tanker

After practice dry plug-ins the drogue was retracted and On-Off-Dump switch inadvertently placed in DUMP. Other aircraft advised that store was dumping fuel. In reaching to secure switch, pilot's forearm struck landing gear handle and lowered wheels at 280 knots.

Gear handle immediately raised but port MLG would not completely retract. Pilot slowed to 185 knots, lowered gear and got indication of 3-down-and-locked. Following visual check normal arrestment was accomplished.

Pilot failed to manually engage landing gear handle up-lock after launch; this fix is specifically provided to prevent such incidents.

Safety pin to prevent inadvertent dumping (local fix) not installed after previous flight.

## Shortcut

T2V Pilot: 2800 total hours, 6 jet hours

In process of transitioning to jet aircraft pilot had five dual T2V hops in the previous three days. On his first T2V solo he failed to latch canopy prior to commencing takeoff roll and at about 135 knots the canopy separated from the aircraft and fell on the runway 8500 feet from point of brake release.

The cockpit takeoff checklist has "Canopy" listed as one of the check items. The kneepad card had "Panel warning lights out" as the first item for takeoff. A solo flight in a jet placed the pilot in a new environment. The situation demanded particular attention to checkoff lists.

## Droopy Droop

F8U-1

Test Flight After Major Check

Following combat-rated liftoff, wing was lowered. When wing indicated down altitude was 800 feet and aircraft began a violent roll to right. Full left aileron stopped it. Altitude loss was 500 feet and recovery made at 300 feet and 350 knots.

During steep climb, pilot noted left outboard droop had failed to retract when wing was lowered.

At 7000 feet and 160 knots wing was raised and slow flight characteristics checked. After dumping and burning down normal landing was made. At flight line wing was cycled repeatedly but left outboard landing droop continued to malfunction until cruise droops were actuated "In" when wing lowered. At this time all droops retracted. No conclusive reason for failure discovered. Panel, actuator and lines replaced with no further trouble experienced.

Comment: Pilot reaction to control difficulty was of high order.

## No Waveoff This Pass!

**FJ-4** **Pacific Island Base**

During course of flight pilot determined inability to transfer 1000 pounds of fuel from aft tank. Landed with only 250 pounds available fuel remaining.

Prior to flight No. 5 fuel probe in starboard wing was replaced. To eliminate necessity of defueling entire system, fuel line between aft fuselage cell and main cell disconnected. Upon completion of work, fuel line not connected even though work order was signed off and aircraft returned to "up" status. As a result, fuel in aft cell could not have been consumed by engine in any manner.

Comment: Immediate flail in Maintenance Department. Revised system for work orders which involve labor by several shops.

## Close Scrape

**A4D-2** **Straight-in Approach; Hung Ordnance**

On a live ordnance flight one practice rocket did not fire from the pipe organ on center station, dictating a straight-in landing approach. From five miles out tower asked twice for gear check with pilot answering "gear-down-and-locked."

The aircraft was flared slightly just prior to touchdown and at the same time pilot saw the "UP" lettering in gear indicator. He heard a scraping sound, slammed the throttle forward, and became airborne very shortly. Another member of the flight visually checked for damage and then pilot landed without further incident.

Tips of both flaps were ground off about one-half inch and the pipe organ on the center store was destroyed by sliding on the runway. One small hole was punched in the aft fuselage by pieces of the pipe organ. A belly landing with ordnance! Whooee!

## Sundowner

**F4D-1** **Pilot: 1000 total hours, 400 in model**

Leading a section, pilot took starboard side of runway. Restrictions to visibility consisted of: (a) instrument hood lying on top of instrument glare shield, (b) setting sun which was directly in pilot's eyes. Line-up with runway was achieved by looking out the left side of cockpit only.

As aircraft passed over threshold the poor line-up was realized and a waveoff initiated. Touchdown occurred about 1000 feet from threshold, 165 feet short of POMOLA glide slope indicator. Starboard wheel was nine feet off runway on hard-surface shoulder. Ground run before becoming airborne on waveoff was 350 feet thus bashing POMOLA and taxi light at an intersection. Balance of waveoff and subsequent landing uneventful with pilot unaware of any damage. Starboard outer wing panel required replacement (plus wooden beams for POMOLA).

Comment: This was described as a case of experienced pilot becoming complacent during landing maneuver, possibly a mental letdown at conclusion of a very comprehensive instrument check.

## No Drill

**TF-1** **Pilot: 1000 hours in model**

As aircraft became airborne from deck launch starboard fire warning light came ON. Power reduced and light went out. All engine instruments indicated normal and no visual indication of fire. Flight continued for two hours to destination ashore.

On inspection, exhaust stack clamp bolt was missing and exhaust stack had backed off No. 1 cylinder. Oil breather duct was burned through. Conduit covering of prop feathering and deicer lead burned through. Firewall aft of No. 1 cylinder burned over 8 by 10 inch area.

Squadron comment: Due to variables involved the decision to land, feather, extinguish, etc., remains with pilot. However, inflight fires are perhaps the most hazardous situation which a pilot can encounter. To treat them lightly is inviting disaster, whether it is an actual fire that can be seen or an indication of such occurrence. In similar circumstances a landing as soon as possible is recommended. If immediate landing not possible, secure engine.

Impress upon maintenance personnel the importance of properly fitting clamp bolts. Inspection of eight aircraft revealed two loosely fitting exhaust stacks. ●

# ASKING FOR IT?

THE pilot of an F9F-8B took off on a cross-country flight. He lost cabin pressure at 25,000 feet temporarily but since he felt no discomfort, he thought nothing of it and did not report the discrepancy on landing. Continuing his flight after a day at this intermediate station which he spent in *high altitude indoctrination,* he again lost pressure, this time at 46,000 feet. He experienced sharp pain in his chest, felt he "was going to die," and finally managed to land, exhausted and feeling nauseated. He spent that afternoon and evening coughing and spitting up blood but still did not report the discrepancy or see a flight surgeon.

The chest pain persisted all night but the pilot took off again the next morning and again lost pressure at 26,000 feet. Landing again at the intermediate station without reporting the incident, the pilot casually mentioned the matter to the base flight surgeon at the club that night. He was advised to check in at Sick Bay but disregarded the advice and took off for his home base the next morning. Again pressure was lost, this time at 23,000 feet, but the pilot managed to land safely. As he again began to cough up blood and the pain in his chest was still present, he grudgingly reported in to Sick Bay. After a day spent at rest on the Ward and a thorough check for possible internal injury, he was released.

It is obvious that this man learned nothing from his training, high altitude indoctrination, or his own common sense. He was flying with the grim reaper at his side through his own doing. Only luck and the good angels preserved him from becoming a costly statistic.

*—Flight Surgeon NAS Glenview*

### Belt Type Raft

AN HRS was ditched in deep water at Kwajelein atoll when the engine failed in level flight at 500 feet. After engine pieces were observed exiting through the clamshell doors the pilot autorotated to a power-off water landing. A heavy swell caused the rotor blades to dig in, and rolled the aircraft on its right side. Two crewmen and an injured passenger exited thru the port escape hatch. A cot, in use as a makeshift litter, then floated up to block this hatch, and the third crewman was forced to dive and exit thru the starboard cabin door. The Mk-7 life raft was trapped by water rushing through the hatch, and went down with the aircraft. A Mayday transmission prior to ditching brought the SAR unit, and all six persons were picked up by a UF after about 90 minutes in the water.

As a result of this and many previous helicopter ditchings in which life rafts have not been retrieved from the aircraft, HU-1 has adopted a one-man belt-type raft pack developed by the Naval Parachute Facility, El Centro, and previously evaluated by HU-1. Correspondence to BuWeps has been initiated recommending use by other units.

This ditching is also a good example of the necessity to maintain a minimum flight altitude

of 500 feet except when the mission requires otherwise (Squadron Doctrine). In this case, the radio call for assistance brought aid long before it could otherwise have been expected. At a lower altitude it is highly improbable that there would have been time to make such a call before the aircraft was ditched. In addition, the pilots had sufficient altitude to secure the engine and execute a well controlled entry into the water. No one was hurt, and assistance arrived promptly. A good example that adherence to doctrine pays off.

## Loses Eye

A TROUBLESHOOTER was working on an AD parked on the flight deck with the engine running. While the propeller of the aircraft on which he was working was turning, a gust lock blew off of the aircraft ahead into the turning propeller. The prop cut the gust lock into two pieces throwing them both outward with high velocity. One of these pieces struck the troubleshooter in the region of the left forehead and eye causing injuries which resulted in the loss of his eye.

The man was wearing his flight deck helmet and goggles at the time of the accident. However he had the goggles raised on his forehead and not over his eyes.

"It is possible," the flight surgeon on the investigation reports, "that had he been wearing his goggles properly he would not have lost his eye. Getting flight deck personnel to properly and continuously use safety equipment while on the flight deck is a never-ending problem. This accident again points out the need for continuous effort on the part of all hands to enforce flight deck safety regulations."

## Buzzing Buzzard

DURING a napalm run, a VMA aircraft was struck by a large buzzard which hit the left side of the windshield. The pilot's helmet visor, which was down, was broken. The squadron flight surgeon states that in his opinion, the pilot would have lost an eye had the visor not been down. He further states that this accident ended any further difficulty in persuading the rest of the squadron pilots to use their visors.

## It Still Happens

AFTER the rescue of personnel from a ditched HSS-1, the crewman reported his life vest had inflated very slowly. Examination by qualified parachute loft personnel revealed a loose cap on the right $CO_2$ cylinder container.

Fortunately, the men were rescued promptly by a plane guard helicopter. In other circumstances, the crewman's difficulty with his life vest could have proven disastrous.


*". . . But, sir, his orders DO read report to VALLEY FORGE."*

Be sure that the $CO_2$ cylinder container caps in your life vest are screwed down tightly. If a cap is loose, when the bayonet is actuated by your pulling the toggle, the $CO_2$ cylinder will move up and either will not be punctured properly or will not be punctured at all.

## Wing Work

MAINTENANCE personnel should exercise extreme care when working on P5M aircraft wings in cold weather. Even a small patch of frost or ice can cause a "slip and fall" accident. Here are two cases in point:

- Last winter a night check electrician's mate was walking on the wing of a P5M parked on concrete. He slipped on ice and frost, lost his footing and fell approximately 25 feet to the deck below. Fortunately, he managed to land on his feet. He survived the accident with a fractured spine and broken bones in his right leg and left foot.
- A crewmember, conducting a ground check on a P5M-2, was walking outboard along the walkway of the port wing. The wing surface was clean but wet from melting morning frost. The crewman slipped, lost his balance, slid over the trailing edge of the wing and fell approximately 25 feet to the concrete ramp below. He landed on his feet, then rolled on his back; his only injury was a fractured right foot.

Personnel in P5M squadrons should be familiar with and use the wing safety line assembly as described in Fig. 471A, p. 856B of AN-01-35EJA-4, Illustrated Parts Catalog for the P5M-1, and Fig. 422A, p. 910, AN 01-35EJB-4, the catalog for the P5M-2. ●

# hell and high water

BECAUSE of the failure of flight deck personnel to communicate to the AD-6 pilot that he was to make an axial takeoff, he made an angle deck takeoff and struck three jets parked outboard on the canted deck. Here is the pilot's description of his experiences as he realized a probable ditching was imminent.

"I saw nothing but blackness. Maintaining full right stick and full right rudder to correct for what felt like a sizeable left yaw, I braced myself in the cockpit for the crash.

"As I waited to hit the water, I tried to imagine the attitude in which I could come to rest and mentally reviewed ditching procedures. I retained full power and concentrated more on maintaining myself in a braced position rather than trying to retract gear or drop external tanks. With no idea of how fast I was dropping into the sea, it seemed more important to ready myself for the crash than to ready the plane.

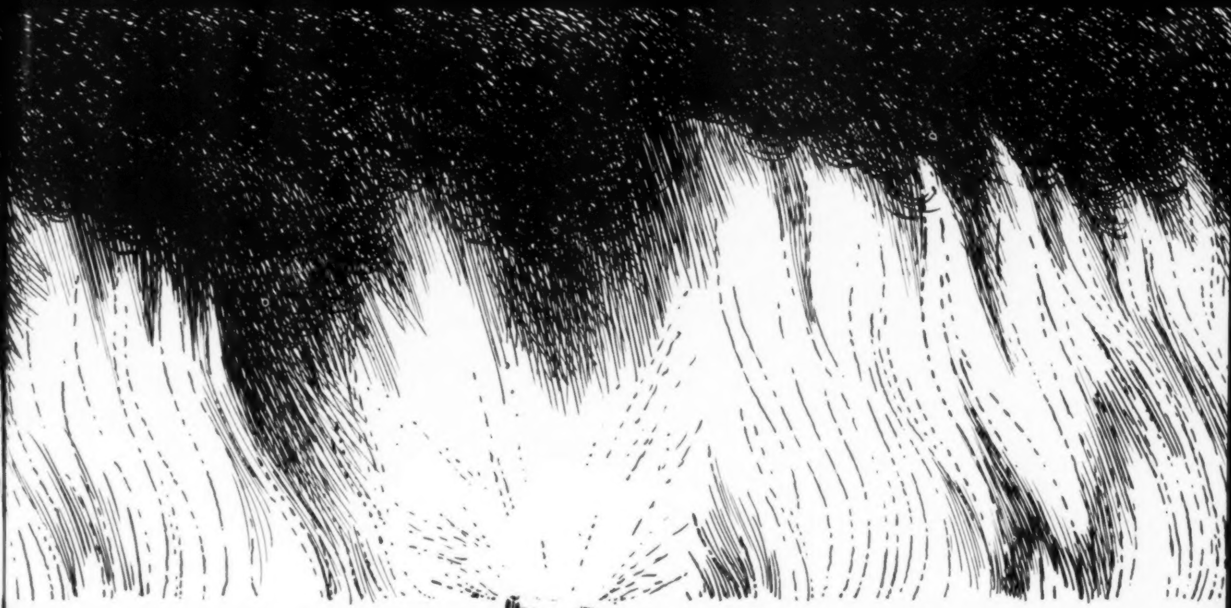
"After what seemed like a mild contact with the water, I found the attitude of the aircraft to be slightly nose-down, slightly port-wing-down and sinking slowly.

"I overcame the desire to do things as hastily as possible. Instead I decided to make the few necessary steps of getting out as correct as possible—to make each movement count. In less time than it takes to describe it, I had the lap belt disconnected, shoulder harness loose and head-phone cable loose. Still not feeling totally free from the aircraft (possibly from not being used to climbing out of a cockpit with a seat pack on), I unfastened the two leg straps and the chest snap of the parachute.

"I stepped over the port side of the cockpit into the water just as the water level was such that it began to pour into the cockpit over the sides—I inflated my life vest immediately.

"I stopped swimming about 10 feet from the aircraft (some part of the empennage remained above the water but it was so dark that I couldn't determine whether it was the rudder or part of the horizontal stabilizer). I turned on my life vest flashlight. Feeling the nylon strap tugging loosely from my life vest, I hauled in the pararaft and felt for the inflation toggle. The raft inflated normally. Next I made two attempts to roll into the raft but was hindered because the lanyard was wound once around the raft. As I rolled into one side I was just rolling the raft over and falling out again.* With

*To "roll into raft" is not the correct procedure. Using raft boarding handles, you should enter over the stern.



the lanyard unwound, I mounted the raft and watched the plane guard destroyer bearing down on me some distance away. I assumed they had seen the light from my life vest flashlight. To give them a better fix, I proceeded to light off the night end of one of my distress signals. It lit immediately.

"In the meantime, unknown to me, a great deal of the fuel from the sinking plane had risen to the surface and I was about in the center of a pool about 40 feet in diameter. Drippings from the flare were sufficient to ignite the whole thing. At least I had no doubt about the destroyer keeping me spotted now!

"I evacuated the raft immediately in an effort to swim underwater and away from the inferno. The inflated life vest discouraged this idea abruptly. Retaining the vest I set about splash-swimming my way out and ultimately reached clear water with a minimum of smoke or fouled air inhaled. I unfastened the raft lanyard while swimming out and the raft burned and collapsed in the fire. With the anti-exposure suit and my hardhat on, I received no burns.

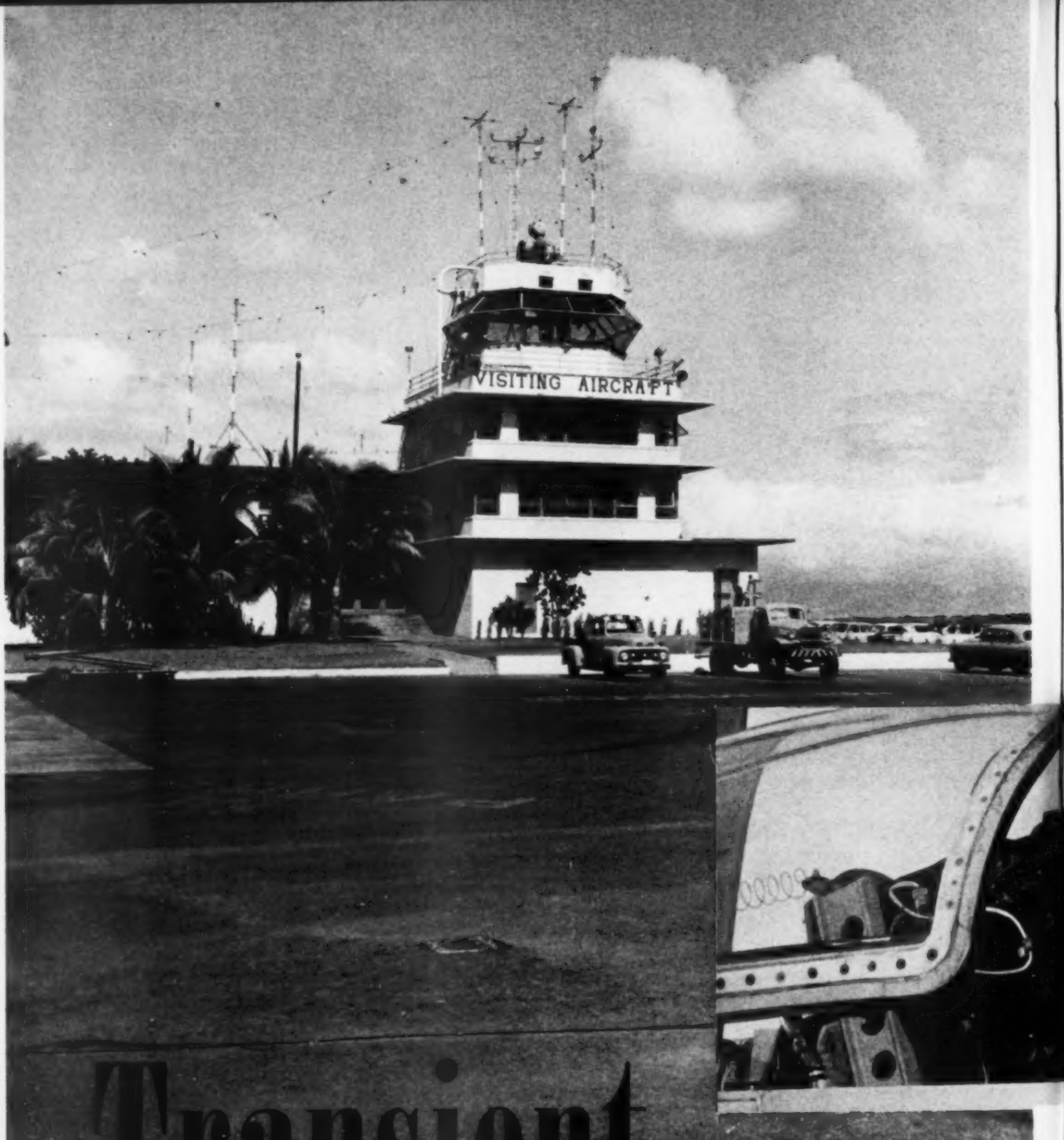
"The destroyer seemed much closer now.

"I noted the inside of my poopy suit seemed damp and clinging. This made treading water take a little more effort and hindered my breathing a little. As a comfort feature, pilots in our squadron wear a heavy ring around our necks with the suit. With the tight-fitting neck piece rolled over this, pressure on the neck itself is relieved. The life vest collar was forced up against this in buoying me up and it wasn't possible to remove the ring. In all, between one and two quarts of water got in. The water itself didn't seem cold but its presence was irritating because it caused the liner to cling and restrict movement.*

"The destroyer was alongside now in what seemed to be a perfect recovery position, and, with the aid of a rope and many helpful arms, I was soon aboard.

"It may be added that the accident occurred under ideal sea state conditions and also I was only in the sea for a short period of time—about 15 minutes." ●

*The first endorser on the AAR states that the wearing of the neck ring or "horse collar" will be discontinued in this squadron. In the event of hand injury, the pilot could not get the ring out. Besides allowing water to leak into the suit, the neck ring can cause the neck seal to be enlarged permanently so that it no longer forms a water-tight seal.




# Transient Service

**Courtesy and consideration on the part of transient aircrews will usually return big dividends.**

IT HAS been said that the first five minutes of a football game tell a great deal about what's going to happen in the remaining 55 minutes. A sharp football fan can detect the playing mood of his team, and of the game, after the first few plays. You might say then, that those first five minutes set the stage for what one can expect to follow.

And the same can be pretty much true at an air station. The first few minutes after your arrival will tell you a lot about what the remainder of your stay will be like. Since they are your first exposure, they will also set your mood, depending on the impression made upon you.

There's hardly anything more exasperating than to arrive at an airfield of the United States Navy feeling tired, hungry, perhaps somewhat on edge from the frustrating radio contacts, and then to find that your arrival is almost resented by the line and service people. After all, they're the ones who are there to make your arrival pleasant and smooth. You can park an airplane by yourself, or by sending out a passenger if you have to, but air stations have line people to do that job. Doesn't it make you grind your teeth then, when you taxi up to the visiting planes area and see men draped around the line shack? Are they out-waiting each other to see who loses and gets to taxi you in? It sure seems so, very often.

One of my junior aviators had it summed up for him very well when he arrived at a USAF base as copilot of a patrol plane. He was amazed at the transient service rendered, not only to his aircraft but to others that came and went during his short visit. A car met the plane, and hustled the crew to Operations. The Airdrome Officer personally asked what service they could render. And when he asked a simple question of a line maintenance man, the answer was, "I don't know sir, *but I'll find out for you right now.*"

When the copilot mentioned this outstanding service compared to what he was accustomed to at Navy stations, the pilot's reply was, "Son, these people are in the flying business: each and every one of them has a full-time job."

I think we are in a position to render just as good service to our flying people as the Air Force if we set about to do it. But that pilot did express something which is painfully true. The Air Force people have been taught that the flying of airplanes is their business. And their ground service people have been taught that they are part of that end product. That service to an airplane, whether it be transient or one of their own, is the only reason they have a job in the first place.

Now, our own people don't have quite the same outlook. They aren't taught it, and the conditions aren't quite the same. Much as I disagree with the pilot whom I quoted earlier, I must admit that he's partly right at least in interpreting the outlook of our transient and service personnel. We are a Navy, engaged in the business of sailing ships. And we have branched out into another domain, the air, without forsaking the first one, the sea. We still speak of the *Fleet*, of powerful *Seagoing* forces, and sometimes quite incidentally, of aircraft carried by our mighty *carriers*.

This feeling of "split loyalty" if you care to call it that, is, I feel, one of the main reasons why the service rendered at our shore

stations is so often marginal. The shore station and its people are imbued with the idea that they are not the fighting Navy, that they are merely "support forces," a shore-based "service station" for the fleet. There isn't that feeling of "vitalness," of being on the first-line team, that exists among service people of the Air Force.

Now, can you imagine the spot you'd be in if you tried to drive from here to Pensacola with no service stations along the way? You'd soon learn that they're more than just "service stations," they're *vital* service stations. The wiping of the windshield is incidental to the necessary services that are performed, but it's a small service that's intended to make you want to come back, or to continue patronizing the same brand. It's a competitive gimmick. The word gets around. The dealers who render the best service wind up with the most customers, the best business. And the dealers are taught that they're there for just one reason—to reap an income. In order to do so they must render service. Good service.

Let's apply that same philosophy to our own "service" people now. Let's face it—technically, they *are* "service" people. And naval aviation is *not* the only part of the Navy. And the bases ashore *do* render a "service station" sort of service to the aircraft of the fleet. And to aircraft of other shore stations, by the way. How better to render service, if that is your primary job, than to render good, efficient, thorough service? If your job is to sharpen pencils, the only criterion of your job quality is that you turn out sharper pencils than anyone else. And if your job is to service transient aircraft, your quality of service is the measure by which your contribution to the Navy is determined.

CRYBABY CLYDE. Who makes unreasonable requests and wants everything . . . including the moon.

JOLLY ROGER. Who wants you to take the part off another aircraft.

Above all though, I want to see our air stations convinced that service is their business, that it's not a menial or secondary task. Somehow the term "service" has a slightly degrading meaning for some folks, they associate service with subservient, or servility. And yet service is a multi-billion dollar business in the commercial world. You might say a hat-check girl in a night club is a pretty remote comparison for a military air station, and yet that little gal is there because the boss knows her service is valuable to his business. She's the first contact with the customer, she's like the first 5 minutes of the ball game. She gets the tired customer to feel, "boy, I'm gonna like it here, this is a good place." No sir, gentlemen, service is not something to be looked down upon. You might look down upon the headwaiter who leads you to your table, but do you know how many headwaiters live above your standard because of your generous tips? To them, good service is good business. Good service pays off. People tip well; they come back again.

Our air stations which are in a position to offer good service to the transient pilot, but don't do it, are in a somewhat different position. They can't look to a directly tangible reward. Better service does not mean more pay. And no tipping is allowed. Instead, the incentive to provide the best service possible, to compete with the brother NAS in the next country or the sister AFB on the other side of town, must come from a very objective appreciation of one's purpose for existence. Even though the Navy traditionally means ships, *your* Naval Air Station exists for one purpose and one purpose only. To enable the Navy's *aircraft* to operate into and out of it safely, smoothly, efficiently. If it were not for Navy aircraft, *your* NAS would be a farmer's pasture—or maybe a housing development. Your air station is there because airplanes of the Navy and Marine Corps *need* it. And they need more than gas and oil . . . they need intelligent, capable, efficient transient service to speed them on their way.

Take a tip from one of Amer-

POISON PENROD. Who threatens to write his Congressman if his aircraft is not repaired within an hour.

EENY MEANY. Who demands that discrepancies be cleared that were on the aircraft when it left the assigned unit.

DOOMSDAY DAN. " . . . Who's the station C.O.?"

ica's foremost manufacturers. Even though they manufacture thousands of very tangible products, from light bulbs to hydro-electric turbines, they still advertise that "*Progress* is our most important product." Let's take the same outlook and become convinced that every air station has one major basic responsibility—that Service is its most important product.

● *If you are a CO, XO Ops or conscientious believer in your facilities capability, glance over the list of those frequent malpractices which have been repeatedly encountered here and there by NASC travelers.*

*a. Only minimum charts, publications and other equipment available in the flight planning room. (There are times when it is difficult to commandeer a pencil.)*

*b. No current and/or vivid display of the airfield, taxi strips, squadron parking area, tower and operations building in the flight planning or other appropriate space.*

*c. Diagram of airfield, parking areas, tower, operations building, and other pertinent data such as climb out clearances not stamped or typed on the reverse side of the DD-175.*

*d. Failure of the starting and electrical power units to be available at the transient parking area for shut down of jet aircraft. If the unit is out of commission, a notice to airmen is warranted.*

*e. Reluctance of personnel to have a ladder so that the pilot can depart an aircraft without exposing certain critical areas, such as ducts and canopy rails, to hob nails.*

*f. Although feasible to avoid, jet aircraft are parked heading downwind increasing the potential for a residual fire during shut down.*

*g. Aircraft are parked too close laterally and longitudinally thus exposing the aircraft behind to damage by and ingestion of foreign objects.*

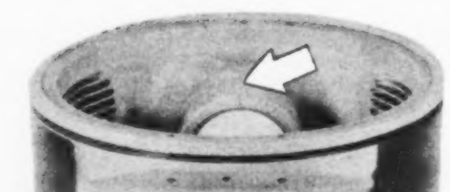
*h. Excessive white lights in and about parking ramps and taxi strips adjacent to operations area. If we can accept dimming lights for the sentries at the gate, it appears that our night flyers deserve comparable consideration.*

*i. Lack of adequate minimal training of personnel who are required to service a wide variety of aircraft. If personnel are not sufficiently familiar with the aircraft, pilots are willing to assist and their assistance should be requested to aid in properly servicing the aircraft.*

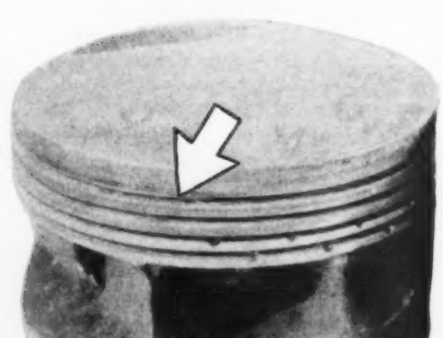
*The above are some of the more noticeable malpractices which have been encountered. There are many others which are not as flagrant. Through the years, there is no doubt that all air stations and facilities have established and pursued vigorous programs to make their activity the most efficient and safest. However, perpetuating a program is often easier said than accomplished. If your activity is committing one or more of the above malpractices, it is time to put more effort in your program to enhance safety.*

# UNDERBOOST—NO SWEAT!

## by LTJG R.M. TORICK, HS-8



Piston pin boss cracking due to underboosting



Piston ring groove wear resulting from ring flutter

MUCH has been discussed and written about the problems of overboost and underboost and drivers of high performance recips are inherently conscious of most of these problems. However those of us in rotary wing operations take a slightly different view of the subject of overboost-underboost due to the operating conditions peculiar to helicopters.

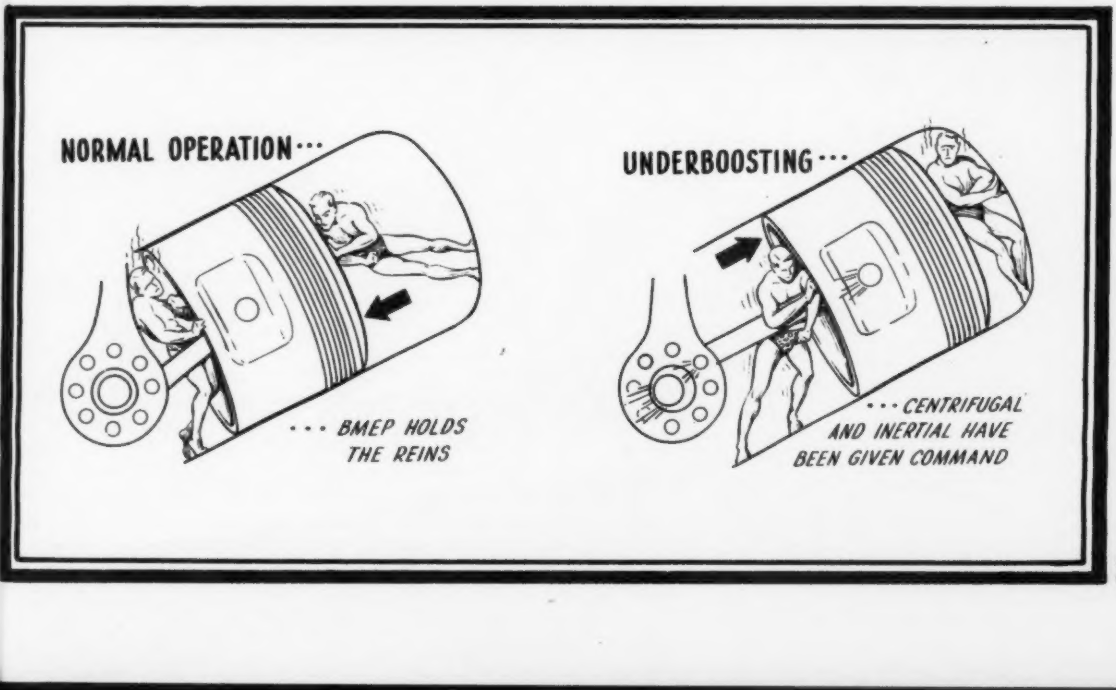
One of these peculiarities, which was misunderstood in this writer's squadron, deals with underboosting. Underboost damage results when insufficient pressure in combustion chambers causes tensile forces to be applied to connecting rods, thereby causing piston rings to be dragged by pistons, the lower or weak side of piston pin bosses to crack, cap ends of con rods to crack or pull off, and rods themselves to fail in tension. The obvious method of resisting such damage is to keep the pressure in the combustion chamber greater than that in the crankcase thereby maintaining compressive forces on connecting rods and other parts which were designed to primarily resist such forces.

In the strict sense of the word, the underboost situation exists during any intake cycle of a four-cycle internal combustion engine when manifold pressure is near or somewhat less than crankcase pressure (atmospheric pressure in many instances). Obviously if engine parts were not built to resist this situation they wouldn't hold together during any condition.

The common usage of the term underboost refers to the aforementioned conditions existing not only during the intake cycle but also during the power cycle when both exhaust and intake valves are closed. If the combustion process is not supported by sufficient mass of fuel-air, the cylinder pressure may actually decrease as the power cycle progresses, and aggravate the situation. This is precisely what happens when an 1820 or 3350 driver drops the nose, throttles back


to the horn, and lets the slip stream drive the prop and drag the engine. Hence the thumb rule, one inch manifold pressure per 100 RPM, to keep sufficient pressure in the combustion chambers to resist the inertial and centrifugal forces being transmitted throughout the engine by the windmilling propeller.

Now to get to the point. Aside from the intake cycle condition described above and when rapidly decelerating the engine, a helicopter power plant can not be seriously underboosted. The freewheeling unit precludes this possibility. At any time the engine is producing sufficient or greater power to overcome its own internal friction and inertia it is either idling disengaged, accelerating, or driving the transmission and rotor systems. The rotor never drives the engine as a prop in fixed wing aircraft. At any time the "needles are married" the engine is not being underboosted in the "damaging" sense of the word. However when the "needles are split" rapidly as during a practice autorotation, a certain amount of underboosting exists as the internal friction of the engine decelerates it to a constant speed. The inference being—don't sweat the underboost! Don't make those normal approaches to a hover vertically because someone said to keep on one inch per 100 RPM. Or don't back off dangerously on the RPM for the same reason. With a windmilling prop keep the pressure on; with a whirling rotor keep the RPM up and don't overboost at the bottom of that flare! ●



NOTES AND COMMENTS ON MAINTENANCE

# LATCH NOT–HATCH NOT.

**OLD PROVERB**

"THE HSS-1 had been airborne on a VFR flight for approximately 1.5 hours. At this time the pilot was flying straight and level at an altitude of 1000 feet and an airspeed of 80 knots. The cabin door was closed and without indication of a malfunction, suddenly parted from the aircraft. Shortly thereafter, while the aircraft was returning to the station, the copilot's window, which was closed, also fell from the aircraft. There was no damage to the aircraft or property, except for the lost hatches."

The above is quoted in part from a Flight Hazard Report and is the first reported loss of two hatches in one flight, but it is typical of a long existing problem in HSS/HUS aircraft.

There were 14 windows and 19 cabin doors lost in HSS/HUS aircraft in 1959! Twenty-three doors and eight windows were reported lost in first eleven months of calendar year 1960!!! Unless more emphasis is placed on improved maintenance inspections, losses will continue at the same rate or even increase. At this time of year a review of the hatch problem is necessary due to the increase in number of hatch losses reported during past cold weather months. The loss of a hatch on an HOK resulting in a fatality and destruction of the aircraft due to rotor disintegration indicates the serious nature of the problem. Although no major accidents have occurred in HSS/HUS aircraft, many cases of the hatches striking the main rotor blades, tail rotor and fuselage point up the potential hazard of the occurrence, not to mention the threat to personnel on the ground in an inhabitated area.

The HSS/HUS sliding window/cabin door problem has been the subject of many Aircraft Service Changes and Revisions, but still continues to plague operating activities. The design of the hatches tends toward weight conservation and is not as rugged as might be found on other type aircraft. Continuing failures indicate that, despite existing Service Changes and Revisions, the problem remains to be solved. In the interim, since the aircraft will be with us for some time, the immediate steps toward alleviating the problem are to recognize the design deficiencies and set up a program to improve maintenance and operation of the hatches. The following guidelines are suggested:

► Comply strictly with installation, rigging and maintenance instructions outlined in Handbook of Maintenance Instructions.

► Inspect latches, fasteners, linkage, cables, track and sliding mechanisms for corrosion, proper lubrication and operation. Further inspect for weakness caused by cracks and deformation of attaching surfaces that would prevent correct seating or alignment. Replace or repair defective and worn parts when noted.

► Conduct periodic functional inspections of all emergency egress equipment in a manner prescribed by applicable directives to insure proper operation and satisfactory security. Secure emergency release controls as directed and maintain appropriate (conspicuous) color schemes to ensure positive identification. A number of recent reports indicate possible inadvertent actuation of the

emergency release either prior to or during flight.

► Incorporate all pertinent Aircraft Service Changes and Revisions.

► Ensure security of all hatches following maintenance, inspection and servicing of the aircraft.

Pilots and flight crews can further assist in reducing inflight loss of hatches and doors by practicing the following rules:

1. Increase emphasis on outside and inside security of sliding hatches during preflight inspection.

2. To prevent inadvertent release of sliding doors and windows, learn location and identification of both normal and emergency releases. Avoid unnecessary contacts with emergency releases.

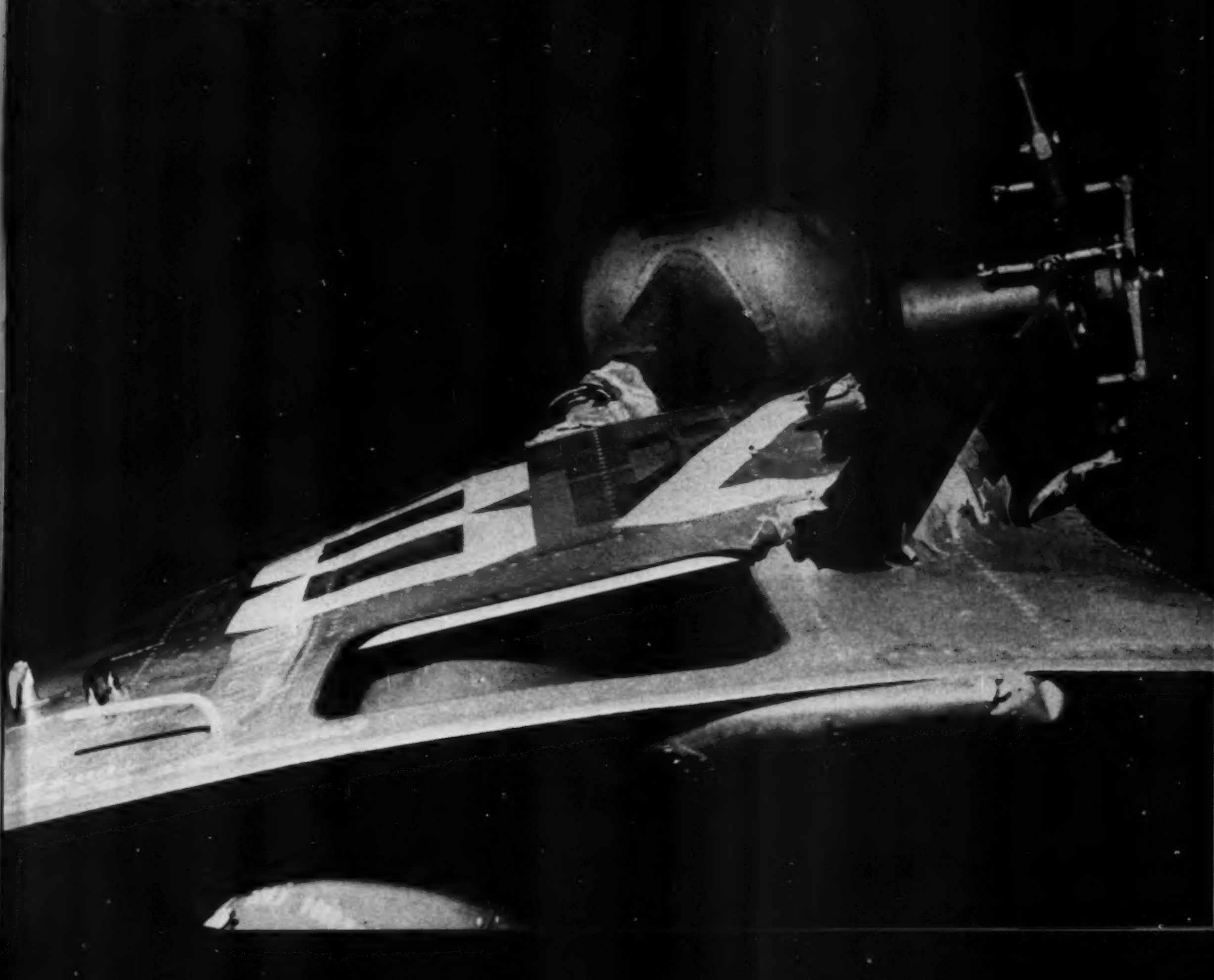
3. Unless an emergency warrants, operate hatches with normal controls only.

4. Report all defective/faulty equipment and dangerous practices that lead to losses inflight.

The comments and recommendations in one report are quoted for information:

"All applicable ASC's had been incorporated. It has been necessary to conduct very frequent inspections of the sliding hatches on the HSS-1/1N in order to keep losses at an acceptable minimum. But a relatively slight misuse or abuse by operating personnel can nullify any inspections of these

A safe landing was made even though cabin door came loose in flight, lodging on tail pylon and damaging all four rotor blades. Cause—the external emergency release handle was tripped inadvertently during passenger entry.



*marginal devices*, and it is possible that such was the case in this instance.

"Recommendations:

"1. That all personnel use extreme care in handling sliding hatches.

"2. That this incident be referred to the manufacturer as additional evidence for the need of a redesign."

To permit continuous appraisal of hatch reliability, activities should continue to report all losses in accordance with OpNav Inst. 3750.6D and BuWeps Inst. 13070.1, including all information on material malfunction or maintenance, and status of applicable Aircraft Service Changes.

In the meantime BuWeps has assigned NADC the task of evaluating and recommending fixes which can be accomplished at the squadron level to further alleviate the problem.

## Rotor Blade Phasing

A RECENT incident involving a HUP-3 wherein the fore and aft rotor blades contacted each other in flight resulted in disintegration of the blades and a forced landing. This incident would have almost certainly been a fatal accident had the aircraft not been in a hover only a few feet above the ground.

The cause of this incident was improper reinstallation of the forward transmission drive shaft after its removal for rotor brake repair. This improper installation points out clearly a breakdown in proper maintenance procedures and ignorance of information contained in AN01-250HCA, Handbook of Maintenance Instructions which states in paragraph 5-141, "Whenever connecting any section of the aft to forward transmission drive shafting, place the rotors in *correct phase relation* as outlined in paragraph 5-143A and B, Rotor Blade Phasing."

The proper procedure for correct phasing of the rotor blades after removal or installation of transmission and/or drive shafting should be explained in detail to all personnel, both enlisted and pilot. This indoctrination should be conducted at the aircraft for education purposes and to insure that your blades are exactly and correctly phased. These correct procedures as outlined in paragraph 5-143A and B must be used any time in the future whenever drive system work is accomplished that could in any way result in a change of the phase relationship between the forward and aft rotor blades.

It is important to note that what has been assumed to be a good phase check, (visual check of blade positions), is not adequate because of the numerous out of phase conditions that can result prior to reaching the point where both a rear and forward rotor blade are directly over the fuselage at the same time. At some point between the in phase and the extreme out of phase position, where visual checking might not detect the condition, the lead/lag damper travel could very well permit the blades to make contact in flight. Again the only correct positive blade phase check is outlined in the HMI, paragraph 5-143A and B.

The moral: Insure that reference is made to the HMI on all component changes, adjustments and work that could possibly affect the flight characteristics of your aircraft.—*Contributed by HU-2*

## Chips Detected

AN HUS was on a scheduled simulated instrument flight. The copilot had control of the aircraft and had commenced a normal let down from 1000 feet altitude, using 2500 rpm and 22"-23" mp. Just after passing through 700 feet, the pilot took the controls and the chip detector light had come ON. An immediate turn toward the shoreline was commenced and letdown was continued. Within five seconds after the chip detector light was noticed, the engine backfired several times and began running rough. The pilot found that he could maintain only 20" mp in his descent and continued down using the power available. A moderate flare was used to stop forward motion at about 6-8 feet altitude and as power was applied to cushion the landing, the engine quit. The estimated time from chip detector light coming ON to engine stoppage was 30 to 40 seconds.

The chip detector light gave the pilot a few seconds of additional warning allowing him to maneuver the aircraft from over the water toward the beach and a safe landing. The board feels the chip detector warning system contributed to saving the aircraft and crew from a possible water landing in this case.—*from a FHIGA*

### Chip Detector Check

HS-8 had recently discovered an accumulation of metal when the engine sump plug was pulled on a routine inspection. No previous chip warning light indication had occurred, and it was discovered that the warning system was not operating properly. It was pointed out that pressing the light merely determines that the light bulb is operative. A check of the warning system can only be accomplished by shorting the terminals on the sump plug when the plug has been removed from the engine for inspection.

## Should I Prepare A FUR?

YES! Of Course! Naturally! All good answers. Unfortunately, this question is often ignored or left unanswered because the discrepancy is considered a minor one easily corrected by adjustment. Repaired and reinstalled items frequently fall in this category because after the discrepancy has been corrected we think there is no need to submit a report.

If one will stop to consider the overall picture, the importance of FUR reporting will be realized. For example, when one activity submits one FUR on one discrepancy, a case history is started. When other activities report the same type discrepancy on a FUR, the case history builds up, a failure trend develops and the problem comes sharply into focus. The essential service experience information then becomes available for proper analysis of the problem and initiation of corrective action on a Navy-wide basis.

Be a positive thinker, help yourself as well as others by submitting FURS on *all* failures, malfunctions and/or material discrepancies.

## Hose Replacement

AN F9F-8 pilot was going through the takeoff checklist when he noted a malfunction of flying tail, saw hydraulic pressure at ZERO psi, added throttle to return to line. As he did so the engine accelerated at an extremely rapid rate followed by explosion in aft part of aircraft. Pilot secured engine, turned fuel master OFF, and evacuated aircraft. Adjacent aircraft called tower for crash trucks which arrived immediately to extinguish fire on bottom port side of aircraft, aft of wing in the vicinity of tail break.

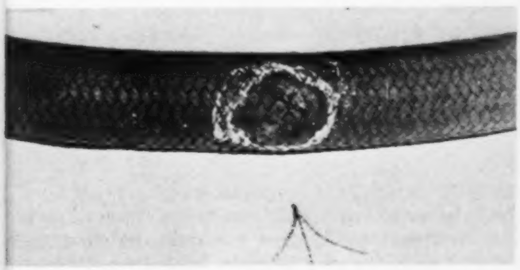
The cause of this incident was the failure of the no. 12 main engine pump line, spraying hydraulic fluid into the plenum chamber which was ignited causing the resulting fire damage to the aircraft. This line was installed in the aircraft 51 days prior and was pressure tested to 3000 psi.

The accident board stated "This is a recognized hazard in F9F-8 aircraft and although all prescribed recommendations relating to checking were complied with, this failure still occurs in F9F-8 aircraft."

The Board recommended that a re-evaluation of the subject hose be made as to the acceptability for use in F9F-8 aircraft with particular emphasis placed on the suitability of using MS28759 type hose which has an operating strength of 3000 psi.

BuWeps message 252025Z of August 1960 NOTAL recommended replacement of the hose which failed in this incident with high pressure hose and directed replacement as soon as possible but not later than the next intermediate inspection after receipt of parts.

It should be noted that the failure which initiated replacement action by BuWeps involved rust in the hose wire braid. No evidence of rust was evident on the failed hose which caused this incident.



Hydraulic hose failure led to fire and explosion damaging fuselage of the Cougar during preparation for takeoff.

# TOPSIDE TOPICS

## Safety Councils Take a Look at Maintenance

### Truth of the Matter

Four accidents involved material factor and with the exception of one, the aircraft were lost. In this type of accident, it is always possible that the real culprit was maintenance error. Thorough investigation into the maintenance practices *prior* to the accident is a must in order to come up with the real truth of the matter.—*ComNavAirPac Safety Bulletin*

### Maintenance Procedures

Accidents caused by faulty maintenance procedures are increasing. All activities are cautioned to insure that all maintenance work is inspected by qualified inspectors.—*ComFAirELM Safety Council*

### Fuel Cell Purging

VCMJ-1 personnel reported the lack of proper fuel cell purging equipment in the Group and aboard the station. This is of primary importance both for safety of men and equipment as well as reducing down time of the aircraft. A liquid compound "Savasol" is recommended in the HMI for F8U aircraft as a suitable purging agent. The use of this compound would require the exclusive use of one refueler.—*MAW-1*

### Emphasis on Maintenance

The loss of aircraft due to poor maintenance and/or lack of headwork during periodic maintenance inspections is exceeding the acquisition rate. Closer attention must be given to the supervision of maintenance personnel, and careful utilization of talent.—*FAir San Diego*

### Enlisted Aviation Safety Counsel

The commanding officer explained the function of the squadron enlisted aviation safety council and the results obtained. NC-5 and FOD hazards have been eliminated since the program has been in effect.—*Alaskan Sea Frontier*

### Ramp Cleaner Speed

The speed of the new ramp vacuum cleaner when operating in unit areas was reported to be excessive. Subsequent investigation has indicated that optimum operating speed for the cleaner is 25 miles per hour. Sweeper personnel have been requested *not* to exceed 15 miles per hour when in the vicinity of aircraft.—*Kaneohe Bay Area*

## Sound Attenuating Devices

Considerable laxness in the use of sound attenuating helmets and ear plugs by personnel working on the jet line has been noticed. Jet engine noises can cause temporary and permanent deafness. Some impairment of hearing is readily apparent in persons who have worked around jet engines without the protection of sound attenuating devices.

Recommendation: That supervisory personnel be directed to require the use of sound attenuating helmets or ear plugs by all personnel assigned to the jet line. *—CNABaTra AvSafBul*

## Enlisted Membership

The Squadron Safety Programs were discussed at length. Much emphasis has been put upon the importance of the Safety Officer's responsibilities and his status of a Department Head. The Chairman strongly urged the squadrons, which have not already done so, to establish enlisted membership in unit Aviation Safety Councils. Good results have been reported from contributions by experienced enlisted ground personnel.*—Hawaii Area Safety Council*

## Deck Spot

A discussion was held concerning aircraft that are sometimes spotted with tails too far over the deck edge for tailpipe inspection, and in the case of the F3H, for speed brake switch inspection by pilots. The council recommended that deck spot procedures should be reviewed to try and alleviate this problem for the pilot. Plane captain inspection of tailpipe area should be completed before aircraft are spotted for launch.*—USS* FRANKLIN D. ROOSEVELT

## Familiarity Breeds . . .

Two ground accidents occurred at the NATF(SI) catapult site during R and D projects. Serious injuries were sustained by experienced personnel at both these accidents. Since most aviation operations do have a potential danger, a routine job must never be allowed to become an accident by overlooking a potential danger. A timely review of seemingly routine practices can often avoid a fatality.*—Lakehurst (Sub-area Council)*

## Clearing Down Gripes

The Commanding Officer of Patron Nineteen explained that in order to prevent aircraft from being flown with safety-of-flight discrepancies, the only persons authorized to write off downing gripes are the officers in charge of detachments, when on detached duty, the maintenance officer or his assistant, or the quality control officer. He also expressed a need for definite guidelines delineating safety of flight items.*—Alaskan Sea Frontier*

## Air Impingement Starter

Effective immediately, a GTC-85 air impingement starter will be connected to jet aircraft prior to shutdown to preclude the possibility of extensive damage due to after shutdown fire. Line personnel will assure that on shutdown the Output Air Control Switch is in the "local" position so that if a fire occurs, the unit can be started and air directed into the engine without assistance from the pilot.*—NAS Willow Grove*

# FOD Prevention

WHAT more can be said about foreign object damage that hasn't already been said? Probably nothing. Yet turbojet engines are still suffering FOD, they are still being rejected to overhaul, and they are still being scrapped.

What are foreign objects? Anything which is not fastened down and can find its way through the engine inlet into the compressor qualifies. This covers a lot of territory; the pencil or security badge in your shirt pocket, the carelessly dropped wire, nuts, bolts, wrenches, screwdrivers, birds, gravel, pieces of runway, rags—you name it and it's a foreign object if it gets in the compressor or turbine wheel.

Let's look at a hypothetical engine for a second. This engine has a first stage compressor wheel 3 feet in diameter, blade tip to blade tip. The blades are 6 inches long. When this wheel is rotated at 8000 rpm, the linear velocity of any point on the blade will range between about 718 to 864 miles per hour.

Imagine what happens when a pebble, a nut, a bolt, or any of the other foreign objects hits one of these blades. Also don't forget that the foreign object is usually moving and the effect is even greater. You've seen automobiles hit head-on at speeds much less than those mentioned and you know the kind of damage they sustain. You can readily understand then what happens to a compressor when foreign objects hit.

What can be done about it?

First, if you haven't already done it, you can set up a FOD Prevention Committee. You can use the FOD Pamphlet published by NASC as a guide for planning and evaluation.

You can follow the example of other bases where FOD programs have reduced damage. Some of them use tool box checkout systems to show if a tool is in or out of the box; some provide handy trash containers on tool carts and ground support equipment. Regular, efficient sweeping of ramps and run-up areas is practiced.

In general, the key to FOD prevention is good housekeeping. If there is a place for everything with everything in its place, if containers for potential foreign objects are liberally placed in work areas, if sweeping is done correctly, and if people working around engines and aircraft exercise care in handling the potential engine wreckers, Foreign Object Damage can be reduced.—*adapted from GE Jet Service News*

AN F9F pilot on the last leg of a cross-country flight reported his right-hand flaperon jammed UP during preflight inspection and ground operation check. He requested an inspection of the hydraulic system by mechanic. Removal of screens and filters revealed no hydraulic system abnormalities. The aircraft was then given a thorough mechanical check.

All wing control system inspection doors were removed and system components examined for damage, operating clearances and possible jams. The system was successfully operated several times in the hangar with no unusual noises or impairment of normal functions. Later the airplane was respotted in the hangar area and jamming occurred when attempting system operation. At this time the wings were folded and a loose object was heard in the left-hand wing. Further inspection produced a loose bolt from this area. The bolt is the same as the one used to attach the flaperon actuating cylinder to wing structure. There were marks of abrasion on the control leading edge push rod, the bolt and the wing rib lightening hole at the outboard bell crank.

It was concluded that the left-hand flaperon actuating cylinder had been removed and replaced or reinstalled with a new bolt, leaving the old bolt in the wing. The scoring marks on the pushrod, bolt and rib indicate the bolt had drifted to a position where it caused a jammed system. Jarring or movement of the aircraft with the wings spread could alternately free or freeze the controls.

### Tool Inventory

Any of the following methods for tool inventory are recommended to help remind the mechanic that his tools are not where they should be upon completing a job:

► Paint an outline of the tool in the box.

► Use a divided cloth pouch to hold each and every tool such as pliers, dikes, screwdrivers, which are normally adrift in the tool box.

► Use any method of sectioning the tool box which will denote a vacancy if anything is missing!

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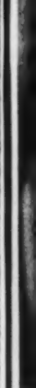

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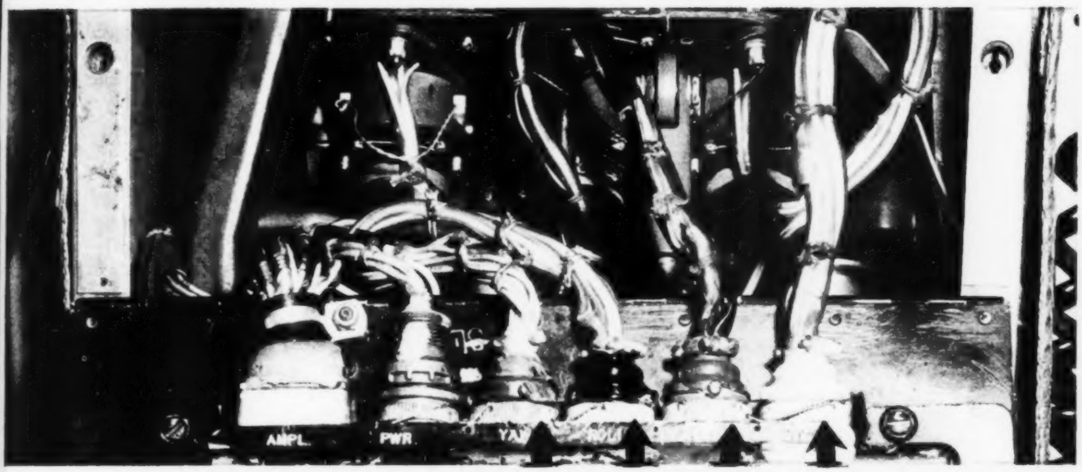
# MURPHY'S LAW*




While engaged in Helo carrier operations, a HSS-1 on initial takeoff from the flight deck experienced reversed flight control conditions with the Automatic Stabilization equipment engaged. Fortunately the aircraft was landed with no injury to personnel nor damage to aircraft.

Maintenance troubleshooting discovered that the cannon plugs from the ASE altitude and pitch servo motors had been reversed. Further investigation disclosed that there are four identical cannon plugs from four identical servo motors side by side behind the motor box panel and any combination of cross-wiring could occur.

To help prevent this application of Murphy's Law from recurring it is recommended that color coding on the cannon plug and its respective receptacle be instigated or as a more positive measure matching plugs and receptacle of different design be utilized for each unit.—*Contributed by W. L. Bennett, CO HelASron Three*

## Murphy Warning

WHILE checking a new HR2S-1 gear box assembly for the proper dash number pitch change bearing, mechanics discovered that the inside half of bearing (SB2300-2) had been installed upside down and pressed into position breaking the bearing carriage and seating the assembly to normal size.

It is recommended all gear boxes drawn from supply be checked prior to installation for proper dash number bearing and bearing condition.

—*MarHelTransRom 462*

*** If an aircraft part can be installed incorrectly, someone will install it that way!**

# CLIPBOARD

## Reliability Sign?

ACHIEVING a total operating time of 210 hours on a jet engine is a feat in itself, and even more so when the original parts installed at the factory are retained on the engine during its usage period.

Operating at high RPM and subject to extremes in temperature, pressure and weather conditions, the Westinghouse J34 jet engine which came to NAS Pensacola from the factory as number 220033 in a T2J provided satisfactory service for nine months with its original factory-installed parts.—*"NavAvNews"*

They crossed the field—
They double-crossed it—
They triple-crossed it—
and still they lost it.
Moral: Practice Low Vis Approaches
—CNAVanTra Bulletin

## Approach and Landing

UNDER the auspices of the Flight Safety Foundation a study has been made of approach and landing incidents over a 12-year period. The preliminary report indicates

(1) an airplane striking the ground prior to the threshold invariably results in a high fatality rate while

(2) if the airplane under control can get by the threshold and remain within the airport boundary high survival is practically assured.

The obvious and immediate lesson is that strict adherence to altitude minimums is the best kind of life insurance.—*TWA "Flite Facts"*

## Believer

During flight one engine of an airliner sputtered, coughed and quit cold. As the plane began losing altitude a lady passenger became alarmed and asked for the services of a priest. None was aboard so she asked a gentleman dressed somewhat like a clergyman to perform the religious rites. He obligingly responded by taking up the collection.

## Proper Cockpit Command Terminology a Must

A recent incident that occurred shortly after takeoff strongly emphasizes the vital importance of giving and executing cockpit commands in the approved manner as shown on the normal and emergency checklists.

The incident evidently was caused by a misunderstanding of commands given in the cockpit. At about 700 feet there was a fire warning on No. 3 engine. The engine was identified and the command given to "feather it." This was followed by the command to shut off combustibles and "dump $CO_2$." This was misinterpreted to mean "dump fuel." The proper command was "select and discharge fire extinguisher." The plane landed and taxied off the runway with fuel still draining from the dump chutes.

Flight personnel are cautioned that they should be aware of the possibility of misunderstanding commands during an emergency and therefore should not act too hastily. Terminology of all checklists should be adhered to strictly. In addition, the first officer and flight engineer always should confirm their actions to the captain.
—*TWA Flite Facts*

### Answers to Altimetry Quiz

1. 2000'
2. Increase approximately 500 feet
3. 3000 feet
4. 1500 feet
5. 4913.2 ft. or 4912 ft.
6. 7,800 ft. True alt. (7,735 ft.)
   5800 ft. absolute alt. (5,735 ft.)
   8000 ft. Pressure alt.
7. 10,380 ft. above sea level
8. 1021 ft. True alt. above sea level

## Ditching Drills

PLANE commanders are not giving ditching drills on at least one leg of every overwater trip. There are instructions requiring that this be done. This means, for example, on a trip to Coco Solo and return a ditching drill should be held on one leg—either mainland to Gtmo, Gtmo to Coco Solo, Coco Solo to Gtmo, or Gtmo to mainland. Pick the most convenient leg, not 2 o'clock in the morning when everyone is asleep.

In addition, of those plane commanders who have been holding drills, many are not simulating ditching procedures to the fullest extent. All procedures will be followed that do not affect the routine of the flight. For example, the rafts and gibson girl will be placed in their proper position for ditching, the rafts will be strapped to the seat, eye glasses will be removed, ties will be removed . . . . Of course, do not depressurize or actually transmit on the emergency frequency, but *all* other procedures will be followed. *We learn by doing.* Also, plane commanders must indicate on the postflight check-off sheet if a drill was conducted or not.—*VR-1*

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**Drills**

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...THE PLANE CAPTAIN


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...THE MAINTENANCE OFFICER


...THE LSO


...HIS WIFE


...HIMSELF


...THE TAXI DIRECTOR


NO SMOKING
AVGAS
...THE SAFETY OFFICER


# P L A N

**PREFLIGHT LEARN ANTICIPATE NAVIGATE**